October 27, 1947

# STEEL

The Magazine of Metalworking and Metalproducing

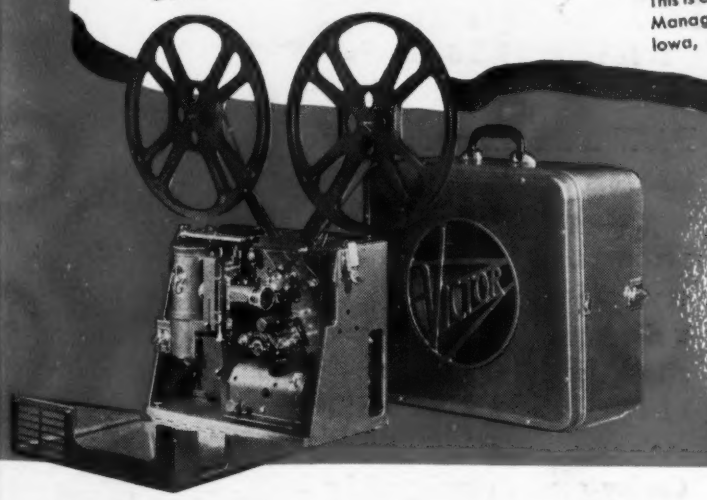
ESTABLISHED 1882

EDITORIAL INDEX, PAGE 39

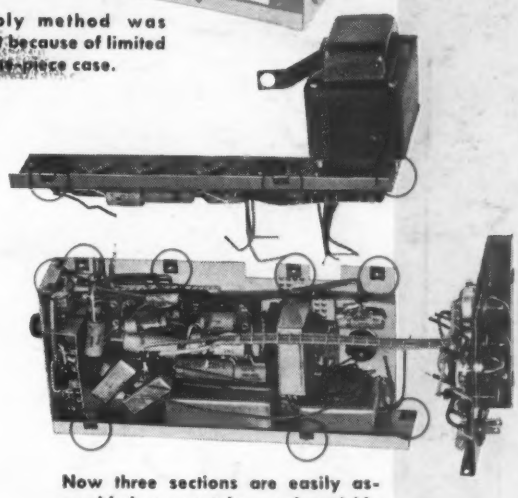
PUBLIC LIBRARY
OCT 27 1947
DETROIT

"We do find that we have reduced our assembly cost approximately 36% on this unit since beginning to use the Tinnerman Speed Nuts"

This is a direct quotation from a letter from A. S. Webeck, Works Manager of the Victor Animatograph Corporation, Davenport, Iowa, makers of 16 MM sound motion picture equipment.



Former assembly method was extremely difficult because of limited confines of the one-piece case.



Now three sections are easily assembled separately, and quickly fastened together with SPEED NUTS into completed unit.

**SPEED NUTS always effect substantial savings in assembly cost, but here is a case of unusually high savings.**

**Victor Animatograph Corporation accepted our suggestions on the assembly of their amplifier unit. They discarded their time-consuming practice of assembling a myriad of small parts in a crowded case. Now the amplifier is assembled in three easy-to-get-at sections that are quickly fastened together with SPEED NUTS to complete the unit.**

**Assembler training time is cut from two months to a few hours. Assembly time is slashed, employee morale improved, and with three assembly lines instead of one, the risk of complete production stoppage due to shortage of one or two parts is avoided.**

**Let us demonstrate what SPEED NUTS can accomplish in improving the assembly of your product.**

**TINNERMAN PRODUCTS, INC.**
**2039 FULTON ROAD • CLEVELAND 13, OHIO**

**In Canada:** Wallace Barnes Co., Ltd., Hamilton, Ontario
**In England:** Simmonds Aerocessories, Ltd., London
**In France:** Aerocessoires Simmonds, S. A., Paris
**In Australia:** Simmonds Aerocessories, Pty. Ltd., Melbourne

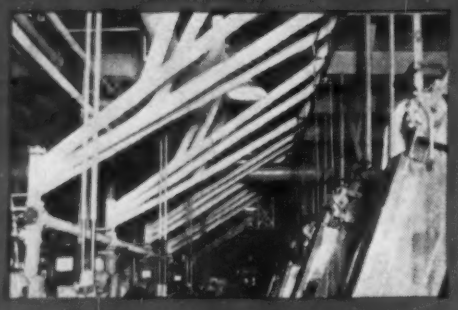
Speed Nuts*
PATENTED
Trade Mark Reg. U. S. Pat. Off.

MORE THAN 4000 SHAPES AND SIZES

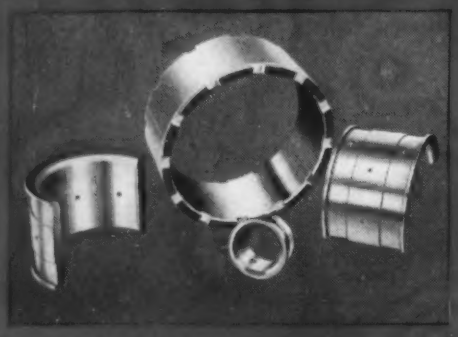
FASTEST THING IN FASTENINGS

# Tubes... for all purposes from one dependable source

... FOR POWER PLANTS



... FOR PRODUCTION PROCESSES



... FOR MECHANICAL PARTS

**B & W MAKES BOTH**

B&W is the one place you can get both Seamless and Welded steel tubes for any requirement in power plants, production processes, or for mechanical uses. B&W Tubes cover the widest variety of analyses available from a single source—from low carbons to high alloys, including a full range of stainless steels of the ferritic and austenitic groups; carbon-molybdenum, S.A.E. and Nitralloy steels, and Croloy grades developed by B&W. By centralizing your tube requirements for all purposes at B&W you simplify tube engineering and purchasing problems. In many cases, authorized distributors in all principal cities can fill your orders promptly from local warehouse stocks of B&W tubes.

Seamless and Welded Tubular Products in a full range of Carbon, Alloy, and Stainless Steels for All Pressure and Mechanical Applications.

★ ★ ★

Other B&W Products

THE BABCOCK & WILCOX CO.

85 LIBERTY STREET · NEW YORK 6, N. Y.

Stationary and Marine Boilers . . . Boiler Components . . . Pulverizers . . . Fuel Burning Equipment . . . Refractories . . . Chemical Recovery Units . . . Process Equipment . . . Alloy Castings.

**BABCOCK & WILCOX SEAMLESS & WELDED TUBES**

THE BABCOCK & WILCOX TUBE COMPANY

GENERAL OFFICES: BEAVER FALLS, PA.

PLANTS: BEAVER FALLS, PA. AND ALLIANCE, OHIO.

# Small and Large RIVETS

Bethlehem furnishes small rivets in sizes 7/16 in. and smaller, lengths 6 in. and shorter, and with button, cone, countersunk, pan and flat heads.

Large rivets are made in sizes from ½ in. to 1¾ in., and in lengths from 2 in., in steps of ⅛ in. They are supplied with button, high-button, countersunk, round-top countersunk, cone and pan heads, also swell neck.

BETHLEHEM STEEL

**BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.**

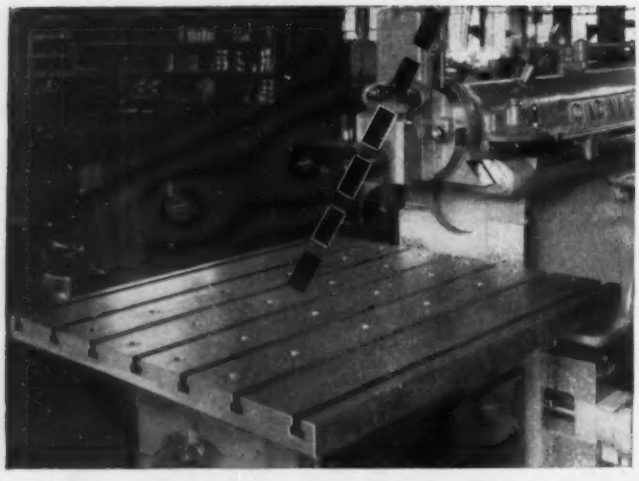
On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation

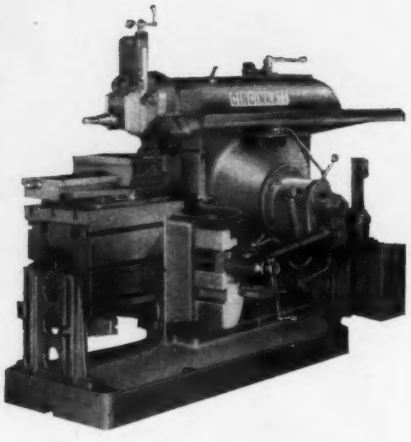
*Export Distributor:* Bethlehem Steel Export Corporation

## *Bethlehem supplies every type of Fastening*

# EXTRA CLAMPING SURFACE HERE...

*Photo courtesy of*
*Marion Machine Foundry & Supply Company*





Some castings are bulky and awkward to handle. Often they present a setup problem, as it may be difficult to clamp them firmly to the regular shaper table.

The large area of the Cincinnati Supplementary Table Top saves setup time, and the full clamping improves the accuracy. It is applied easily and widens the use of Cincinnati Shapers. It is just one of the many useful accessories available.

Cincinnati Shapers are powerful and have a lasting built-in accuracy. They are profitable in the shop.

Write for Catalog N-3.

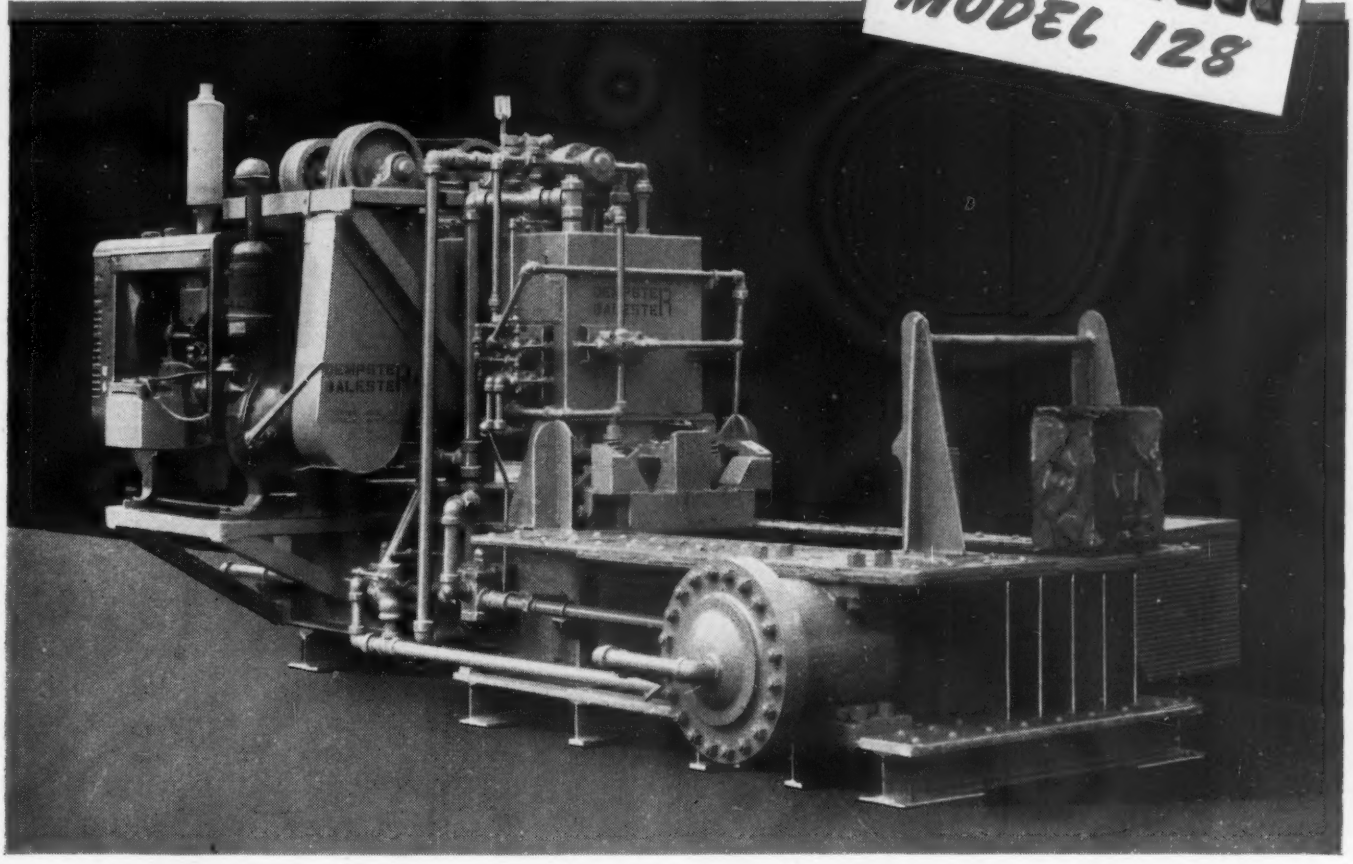
**THE CINCINNATI SHAPER CO.**

CINCINNATI 25, OHIO U.S.A.

SHAPERS · SHEARS · BRAKES

# FOR HIGH SPEED SCRAP METAL BALING

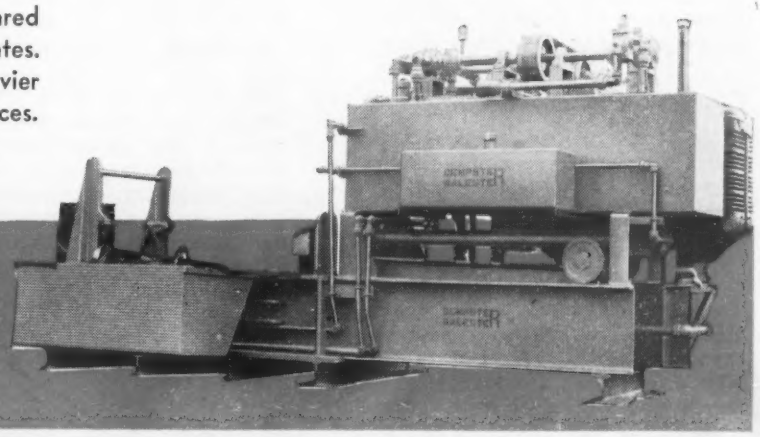
## DEMPSTER BALESTER MODEL 128



If you are looking for a portable baling press built to deliver dependable service at high speeds, you'll find it in the new Dempster-Balester Model 128. Featuring two hydraulic pumps, one a double pump, and an extra large oil tank, the Model 128 speeds up hydraulic operations about 50 percent . . . resulting in greatly increased production.

On the Dempster-Balester 128, all points are built oversize to withstand internal stresses beyond the normal need of baling. Charging box is squared and lined with smooth, machined, abrasion plates. Delivers a high density 125 pound and heavier bale that is easily handled from baler to furnaces.

The Dempster-Balester 128 is available with either Electric, Diesel or Gas Motors. This applies also to the Model 125 standard baler and the Model 275, a heavy duty baler that delivers 300 pound bales. One of these is certain to fit your baling requirements. Write or wire today for complete information.



DEMPSTER BALESTER

TRADE MARK REG.

**DEMPSTER BROTHERS, Inc., 5107 Springdale Ave., Knoxville 17, Tenn.**

# Behind the Scenes...

## Restyled Tail

For all you model railroad fans in our audience, we have picked up an item to whet your appetites. It's a designer's idea of the caboose of the future, and you'll find it on page 6 of the current issue of "Steel Horizons", super house-organ published by Allegheny-Ludlum Steel Corp., Pittsburgh. We've seen a lot of designs of passenger cars of the future with all sorts of novel ideas incorporated, but this is the first attempt we've noticed to add to the comfort of such perennial railroad passengers as the freight crews. It's a mighty smart little number, too, which would add distinction to any outfit, whether full size or model.

## Puzzle Corner

Well, there are a lot of snail watchers among our good family of readers, so the habits of the gastropod mollusks hold no mysteries to them. They all seemed to know that the snail would require 22 days to circumnavigate the wall. And although not announced as a problem, the f & k paragraph in the issue of two weeks ago contained one of the letters in question, first spied and reported by George Muir of the Machine Tool & Gauge division of Fuller Brush, Hartford, Conn.

## Wot! No Steel?

We have been trying to sell the editors on printing an article to answer the loads of questions we've received, all on the same subject. We have tried wheedling, bribery, coercion, and nearly everything short of war. They remain completely uncooperative, however, and refuse to have any part of our proposed article. We just can't understand it. With all the reader interest in this subject, it would certainly be a natural. All they would have to do is tell our readers where they can get some steel!

## Clem's Clamor

Anent the steel situation, mentioned above, if you are reading this message a day late you will know henceforth that this is steel-less Tuesday, in accordance with the following proclamation just received: "We proclaim next Tuesday to be steel-less Tuesday to remind you people with steel of the sad plight of poor needy Clement Caditz, purchasing agent at Northern Metal Products Co., who hasn't got any steel at all. By not selling any steel on Tuesday to anyone else you will then no doubt have some for the relief of Clem Caditz. His starving condition can be relieved by (here poor Clem has inserted a batch of sheet and strip specs)." We hope that Clem, who apparently is a smart purchasing agent, will let us know how his proclamation works out. Perhaps after Tuesday the Northern Metal Products Co. 3300 W. Lake St., Chicago, will be back in business again.

## Wire Beats Path

Every so often the most famous remark attributed to R. W. Emerson bobs up in such a way that we can make use of it in this column. The latest one has to do with a character who in his own devious way manages to come up every once in a while with some odd lots of steel. When he latches on to some stuff which is a little unusual, he calls up here to find out what he can do with it. The other day he appeared with a tonnage of copper coated wire. We didn't know off hand just what he could do with copper coated wire, but we are basically helpful around here and a few discreet questions were asked in the right places and the answer showed up. Seems that the principal market for the stuff is in the manufacture of mousetraps, and so, following the precepts of Emerson, our friend is now beating a path to the doors of mousetrap makers to sell his copper coated wire!

## No Show

Since this is the last issue in October, we wish we could give you a report on the antics behind the scenes at the Metal Show, but because we have to write this so far in advance, all we know now is that our booth is being erected and by the time you see this it will have been torn down and returned to its crates for another year. Everybody will have gone home and the Lewp will once again be returned to Chicagoans. Maybe we should pull the time-honored and always discovered trick of newsmen and write a predate story about the show—that would probably be one sure way of bringing a sudden and unexpected earthquake to the International Amphitheatre, calling off the whole deal.

Shrdlu

(Editorial Index—page 39)

STEEL

Vol. 121—No. 17 October 27, 1947

**BUSINESS STAFF**

GEORGE O. HAYS
*Business Manager*

**ADVERTISING**

R. C. JAENKE
*Advertising Manager*

C. H. BAILEY
*Service Manager*

A. V. ANDERSON
*Production Manager*

*New York:*
E. W. KREUTZBERG, K. A. ZOLLNER
*Pittsburgh:*
S. H. JASPER, B. C. SNELL
*Chicago:*
L. C. PELOTT, V. G. BRETTMAN
*Cleveland:*
D. C. KIEFER, H. G. ROWLAND
*Los Angeles:*
F. J. FULLER

•

**CIRCULATION AND MARKET RESEARCH**

J. W. ZUBER
*Director*
R. L. HARTFORD
*Research Manager*
H. E. METZNER
*Circulation*
R. C. RICE
*Readers' Service*
G. R. EBERSOLE
*Mail & List Service*

*Field Representatives:*
H. R. DUNNE
D. G. HEWITT
G. D. LUKE
C. PETTIGREW
C. A. PRICE

•

**MAIN OFFICE**

Penton Building, Cleveland 13, Ohio

**BRANCH OFFICES**

*New York* 17.....16 East 43rd St.
*Chicago* 11.....520 North Michigan Ave.
*Pittsburgh* 19.....2806 Koppers Bldg.
*Detroit* 2.....6560 Cass Ave.
*Washington* 4...956 National Press Bldg.
*Los Angeles* 4.130 N. New Hampshire Ave.
*London:* 2 Caxton St., Westminster, S.W.1

• • •

Published by THE PENTON PUBLISHING Co., Penton Building, Cleveland 13, Ohio, E. L. SHANER, President and Treasurer; G. O. HAYS, Vice President and General Manager; R. C. JAENKE, Vice President; F. G. STEINEBACH, Vice President and Secretary; E. L. WERNER, Assistant Treasurer. Member, Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers' Association.

Published every Monday. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $18. Single copies (current issues) 35c. Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879. Copyright 1947 by the Penton Publishing Co.

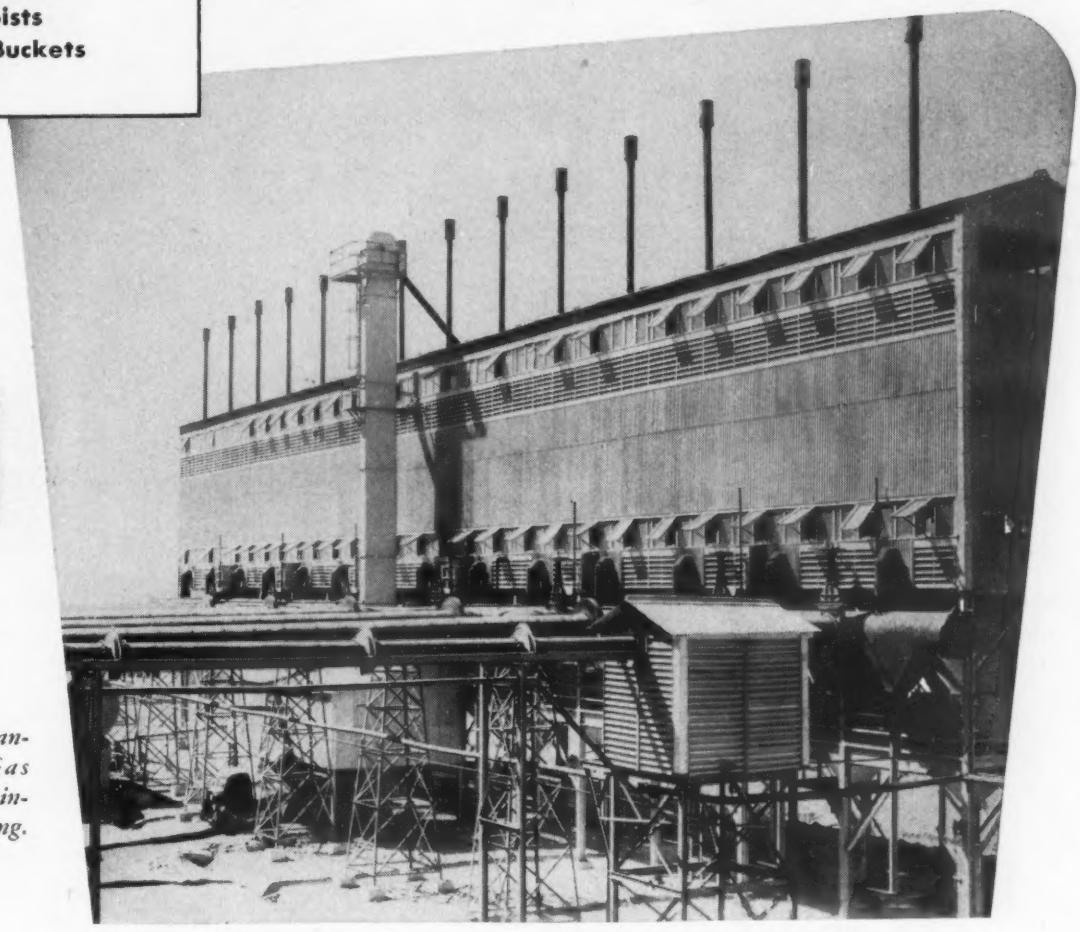
*Editorial Staff on Contents Page*

**Wellman will build it**

Special Cranes
Gas Producer Plants
Ore Bridges
Charging Machines
Industrial Furnaces
Car Dumpers
Gas Flue Systems
Gas Reversing Valves
Coke Pushers
Mine Hoists
Skip Hoists
Clamshell Buckets

# Wellman-Galusha Clean Gas Generators

***Cut fuel costs***



*14 largest-size Wellman-Galusha Clean Gas Generators are all installed in one building.*

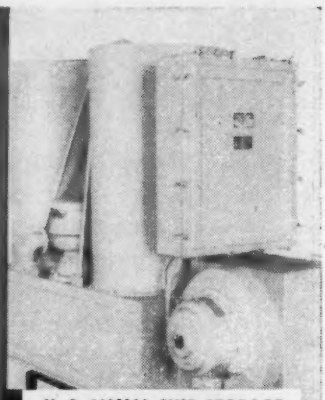
• Wellman-Galusha Clean Gas Generators supply low-cost fuel for heating and heat-treating furnaces in steel and non-ferrous metal industries, glass melting and annealing and kilns and furnaces for the ceramic industry. Also for special compositions of gas.

**THE WELLMAN ENGINEERING COMPANY**

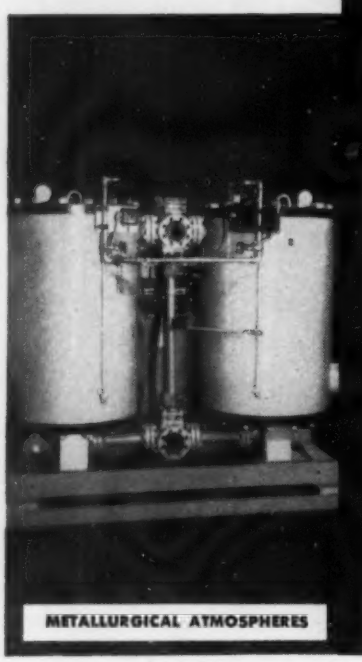
7029 CENTRAL AVENUE • CLEVELAND 4, OHIO

# MOISTURE - - - -

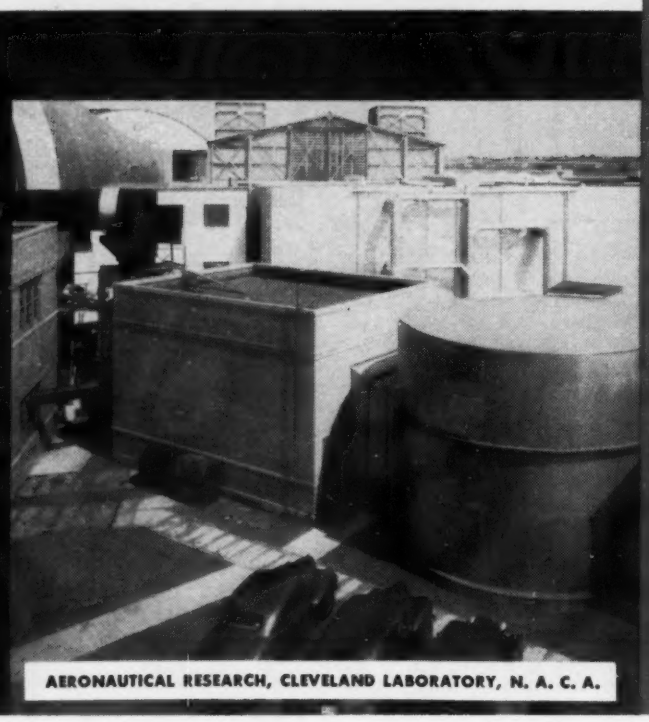
## *going, going, gone*



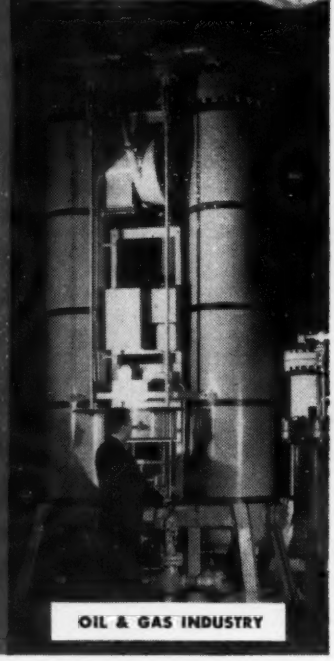
U. S. NAVAL SHIP STORAGE



METALLURGICAL ATMOSPHERES



AERONAUTICAL RESEARCH, CLEVELAND LABORATORY, N. A. C. A.



OIL & GAS INDUSTRY

Thousands of Lectrodryers*—charged with Alcoa Activated† Alumina—are solving dehumidification and dehydration problems all over the world. From small portable dryers using but a few handfuls of Activated Alumina, to wind-tunnel air dryers containing carloads, these machines operate under all kinds of conditions—serve all kinds of industries.

Yet one desiccant—Alcoa Activated Alumina—functions with high efficiency in *all* of these wide-spread and varied applications.

The Pittsburgh Lectrodryer Corporation chose Activated Alumina because it is among the very few drying agents that can hold appreciable quantities of moisture without objectionable changes in form or properties . . . because with Activated Alumina, Lectrodryer provides Industry with a practical, efficient and economical system capable of removing substantially 100 per cent of the moisture from vapors, gases and liquids.

If MOISTURE is a problem with you, why not write or call your nearest Alcoa sales office *today*. ALUMINUM COMPANY OF AMERICA, CHEMICALS DIVISION, 1782 Gulf Building, Pittsburgh 19, Pa.

*Lectrodryer Equipment, manufactured by Pittsburgh Lectrodryer Corporation.

†"Alcoa" and "Activated" are registered trade-marks of Aluminum Company of America.

ALCOA

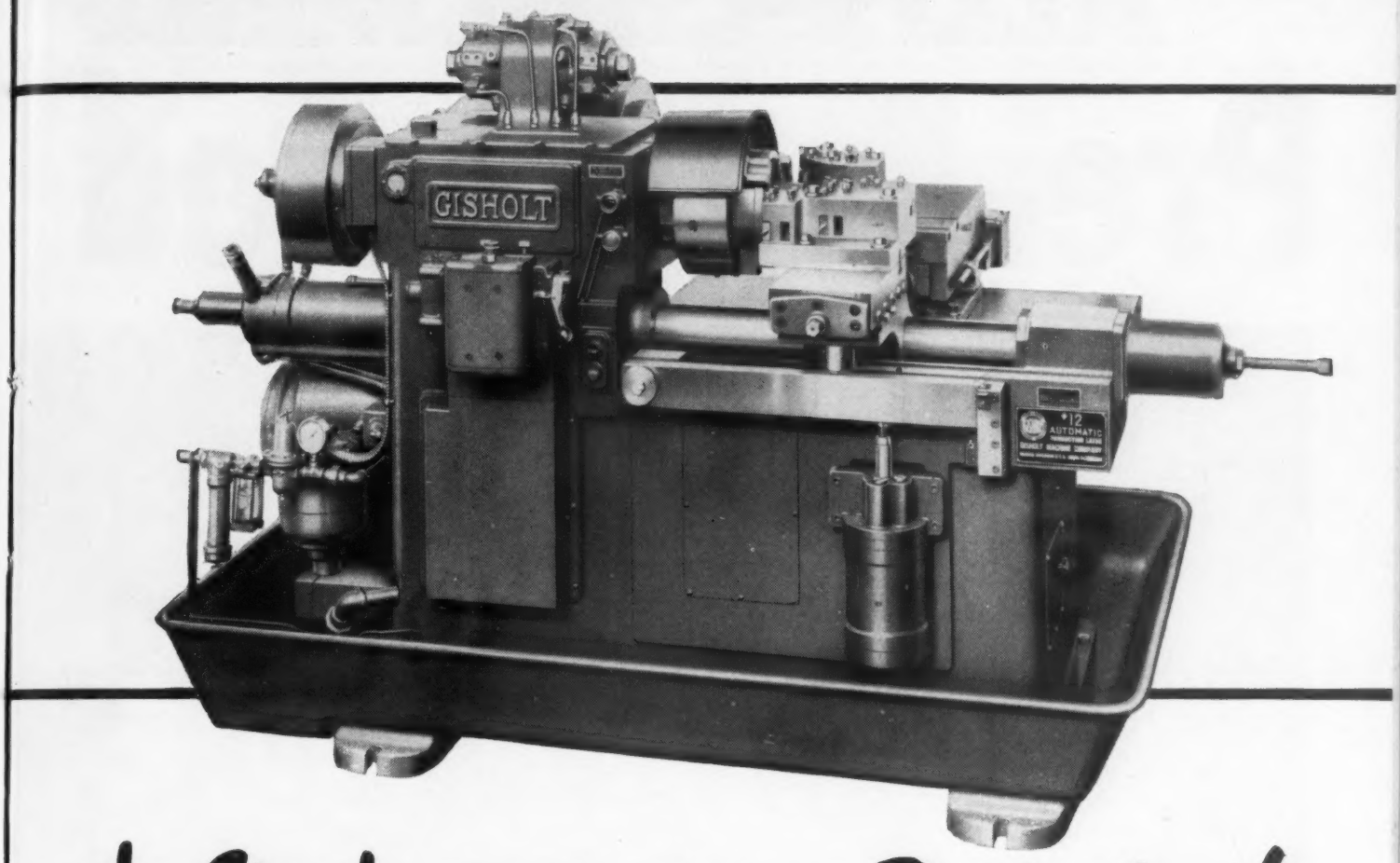
ALUMINUM

# ALCOA CHEMICALS

## ALUMINAS AND FLUORIDES

FORMERLY SOLD UNDER THE TRADE NAME "ALORCO"

# GISHOLT NO. 12 HYDRAULIC AUTOMATIC LATHE




## the Simple way to step-up Production!

If you have large volumes of parts to duplicate within close limits of accuracy, investigate the Gisholt No. 12 Hydraulic Automatic Lathe.

1 ***Fully automatic.*** The operator has only to load and remove the work.

2 ***Easy set-up.*** Partial cuts can be taken without running the machine through the entire cycle. It is always easy to arrange tooling to best advantage.

3 ***Versatile.*** Ideal for chucking, between-centers, or fixture-held work. There is no changing of cams or gears for different jobs.

4 ***Fast.*** All tool movements are performed by hydraulic pressures, including rapid approach, feed during cuts, fade out and rapid return. Productivity is increased by extreme rigidity that enables you to take multiple cuts smoothly and without vibration. Time of the whole operation is equal to the time of the longest cut.

These are but a few of the reasons why the Gisholt Hydraulic Automatic Lathe is first choice in many of America's foremost machine shops. Write for complete information.

**GISHOLT MACHINE COMPANY**

*Madison 3, Wisconsin*

**The GISHOLT Round Table**

*represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.*

**TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINE**

# ALLIS-CHALMERS

# Pre-Engineered

## COMPLETE AUTHORITATIVE PRACTICAL

**— ONLY ALLIS-CHALMERS OFFERS YOU THIS ADVANCED ENGINEERING**

**THIS IS** the most complete V-belt drive reference book ever published. It contains:

**PRE-ENGINEERED DRIVE TABLES**—1 to 150 hp, thumb-indexed for quick reference. Just turn to the page you want — read off the complete drive data.

**ENGINEERING TABLES** — sheave dimensions — drive selections — general information. Everything carefully arranged and indexed for easy figuring of special drives.

Book contains 144 pages, size 8½ by 11 inches. Thumb index and classified index make it easy to use.

# ANNOUNCES
# Texrope Drives

## ..and a NEW Texrope Manual that Makes Selection Easy

THIS MANUAL marks a revolutionary advance in the application of V-belt drives. It enables every user to select, with unerring accuracy, the one *best* drive for any normal requirement. It eliminates guesswork, figuring and chance for error. It assures greatest possible economy and efficiency in the use of Texrope V-belt drive equipment.

### SOLVES 90% OF ALL V-BELT DRIVE SELECTION PROBLEMS

Texrope Pre-Engineered stock drives tables have been worked out in a complete range of speeds, for horsepowers from 1 to 150. These tables show, in one place, the correct drive for any requirement. Each is the *one best drive* for the job, as pre-engineered by the finest V-belt engineering staff in the world.

### MOST ECONOMICAL, IN BOTH FIRST COST, MAINTENANCE

Every Pre-Engineered drive selection is made up of regular Texrope stock items. No special-order equipment is required. You can't make the mistake of buying a larger, more expensive drive than you really need, or of installing an underpowered drive that will be costly in performance and maintenance. Texrope Pre-Engineered drive selections are the *best* engineered drives — in low first cost — in performance—in reduced maintenance.

### THE RESULT OF 22 YEARS OF V-BELT EXPERIENCE

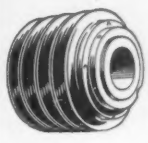
Only Allis-Chalmers has developed a complete Pre-Engineered drive manual. It is more than the work of slide-rules or the rearrangement of old tables. It includes the industry's greatest V-belt drive experience—the knowledge and judgment gained through 22 years of building and studying V-belt drives for every industrial application.

Copies of this new manual have been sent to many Texrope users and dealers. If you have not received one, write for Texbook No. 20P40. ALLIS-CHALMERS, MILWAUKEE 1, WISCONSIN. A 2249

### TEXROPE.. Greatest Name in V-Belt Drives

**"Super 7" V-BELTS**
Five Types — Sizes to suit every power transmission job.

**Texsteel, Texdrive, "Magic-Grip"**
— sheaves in a full range of sizes, grooves.



**"Vari-Pitch" SHEAVES**
Exact variations in speed, stationary or motion control.

**SPEED CHANGERS**
Speed variations up to 375% at the turn of a crank.

**ENGINEERING**
Finest V-Belt engineering talent in the world—at your call.

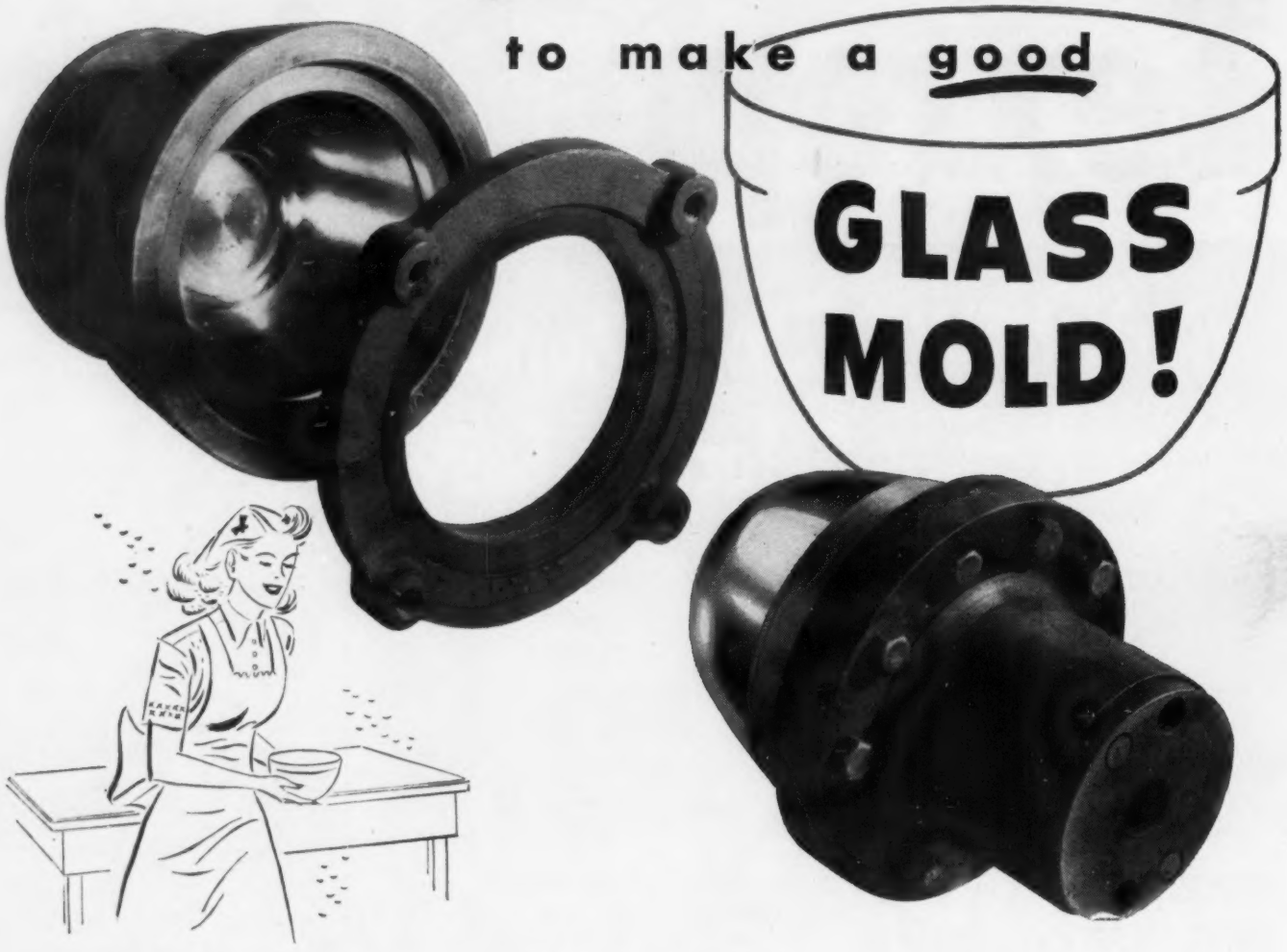
TEXROPE "Super 7" V-Belts result from the cooperative research of two great companies — Allis-Chalmers and B. F. Goodrich. They are sold only by A-C.

# ALLIS-CHALMERS

**One of the Big 3 in Electric Power Equipment — Biggest of All in Range of Industrial Products**

1847 1947
A CENTURY OF SERVICE
to Industry
THAT MADE
America Great

# It takes good PIG IRON to make a good GLASS MOLD!



This glass mold for mixing bowls—used by one of the nation's largest producers of heat-resistant glass products—is made of Republic CHATEAUGAY Pig Iron. Why? Because CHATEAUGAY is the *one* iron which can be depended upon *every time* to provide smooth, flawless machined surfaces.

Here is a story of vital importance to every casting producer. It's the story of CHATEAUGAY's *dense, fine grain structure—uniform distribution of chemical elements—fast flowing and even cooling characteristics* —all of which contribute to the plus value of every CHATEAUGAY casting.

Add the fact that CHATEAUGAY castings are strong and tough . . . provide hard surfaces that resist heat, acid and wear . . . are surprisingly easy and economical to machine . . . and you'll see why leading foundrymen everywhere insist upon using this low-phosphorous, copper-free pig iron that consistently out-performs other irons.

Complete information and helpful metallurgical assistance on request. Write to:

**REPUBLIC STEEL CORPORATION**
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N.Y.

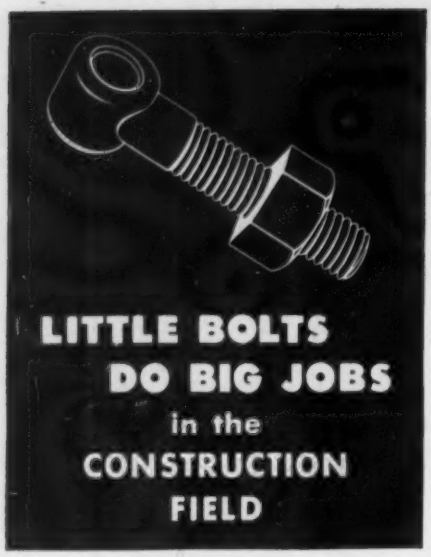
## Republic PIG IRON

| "CHATEAUGAY" | "REPUBLIC" | "PIONEER" |
|---|---|---|
| Low-Phosphorus, Copper-Free | (Northern) Foundry, Basic and Malleable | (Southern) Foundry and Basic |

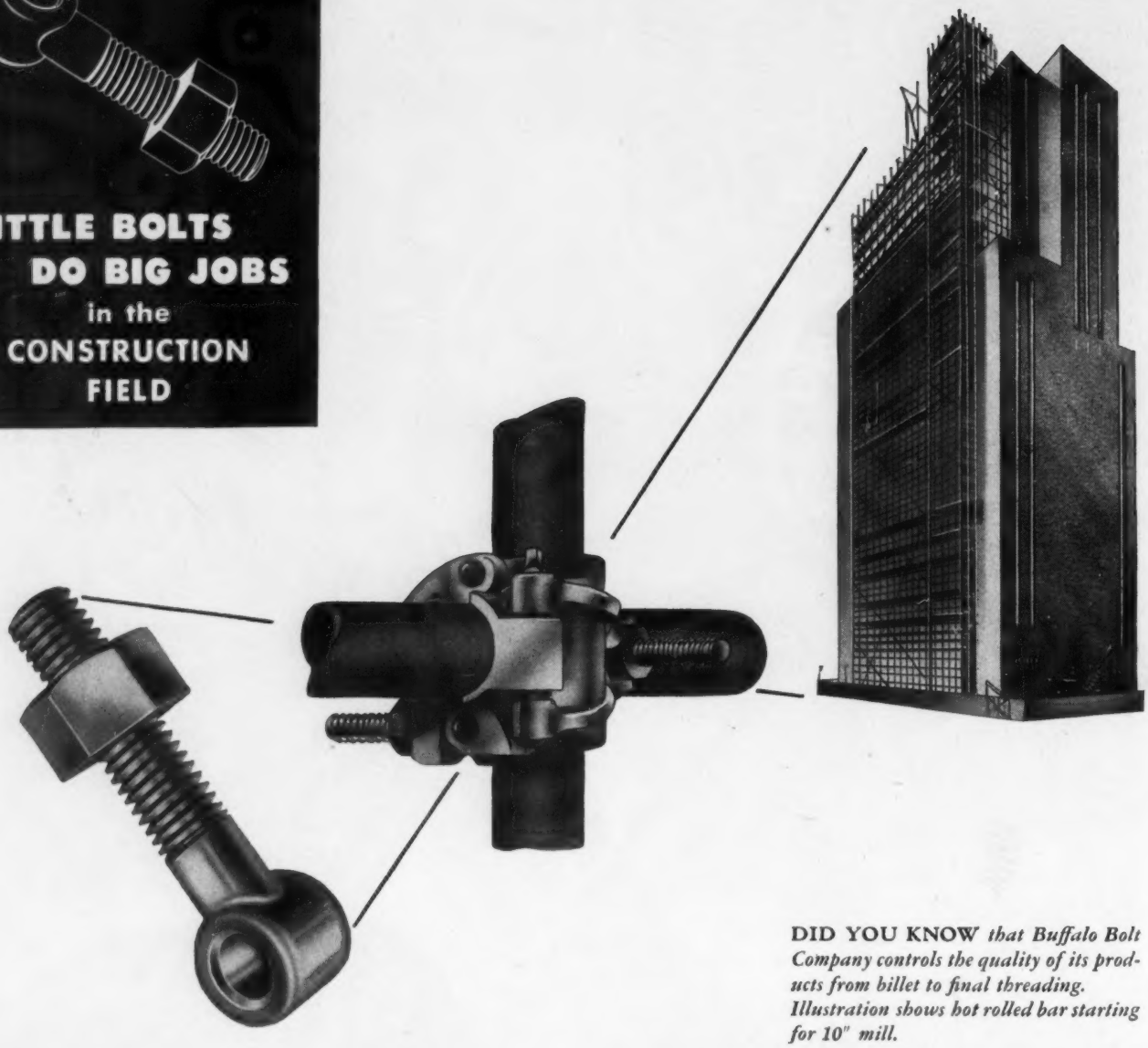
REPUBLIC STEEL

**ALSO TRUSCON FOUNDRY FLASKS • REPUBLIC CORE WIRE • FOUNDRY NAILS**

"TRULY LIFE-TIME MOTORS"
B-LINE
"B-Line" out in Front
B-LINE MOTORS
1/6 to 30 HP
B-LINE GEARMOTORS
All Standard and
Special Ratios
TOOLMASTER
Electric Grinders
Pedestal & Bench
Wire or write for Bulletin
THE BROWN-BROCKMEYER COMPANY
PLANTS AT DAYTON, WILMINGTON, WASHINGTON AND XENIA, OHIO
GENERAL OFFICES, DAYTON 1, OHIO
District Offices in Principal Cities



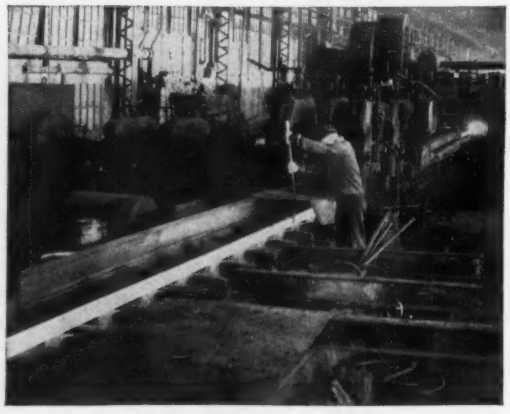
**LITTLE BOLTS DO BIG JOBS** in the **CONSTRUCTION FIELD**



DID YOU KNOW *that Buffalo Bolt Company controls the quality of its products from billet to final threading. Illustration shows hot rolled bar starting for 10" mill.*

● Modern scaffolding makes it possible to erect or renovate large structures with unbelievable speed, efficiency and safety . . . an accomplishment in which small fasteners play a highly important part. For it is upon the strength and reliability of fasteners such as the special Circle Ⓑ Bolt illustrated that the ultimate utility of the scaffolding depends.

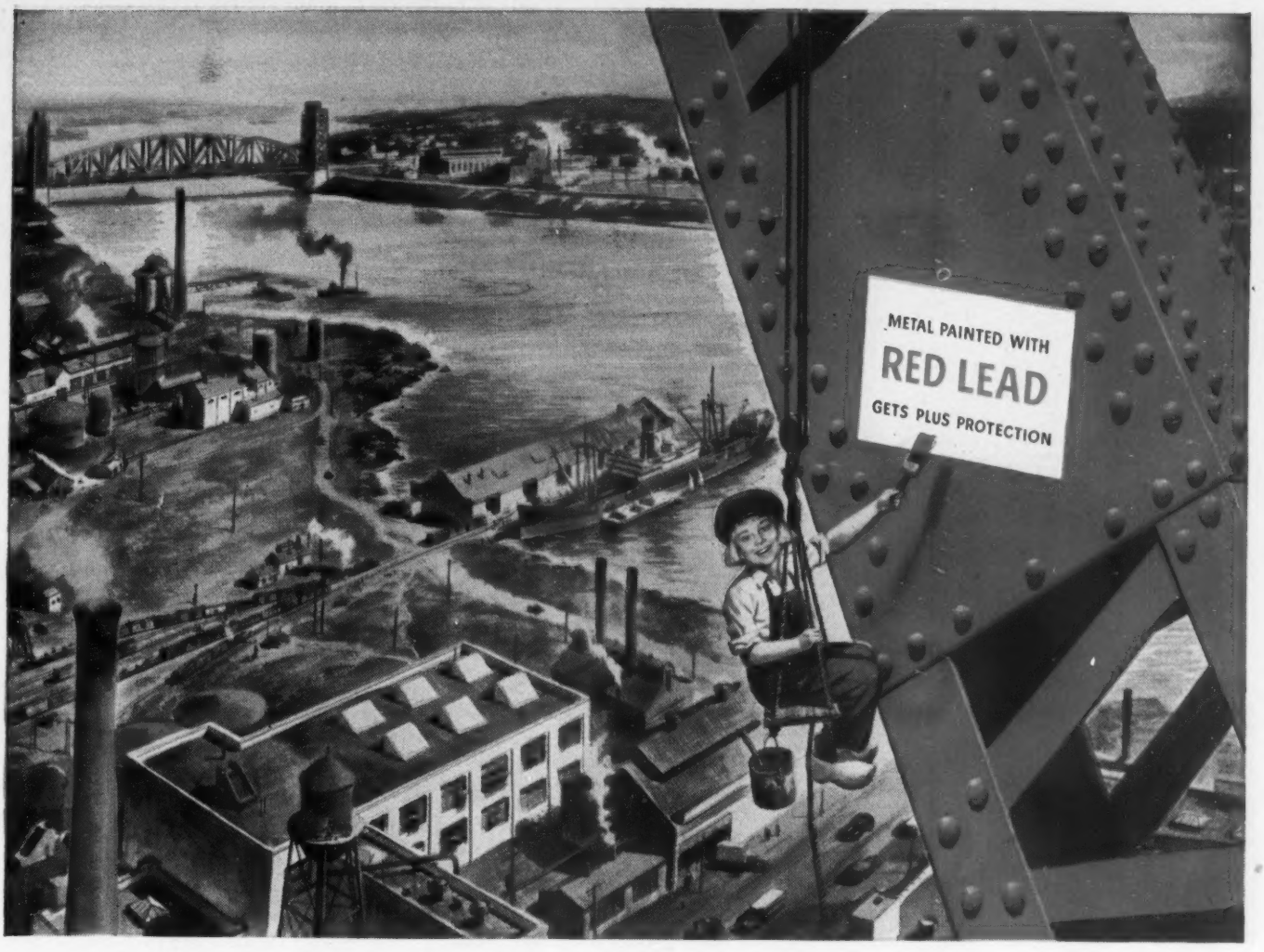
Circle Ⓑ Fasteners have a long-standing reputation throughout industry for dependability . . . for uniform size and strength. That's why you will find Circle Ⓑ Bolts and Nuts . . . standard and special . . . used so extensively on such a wide variety of well-known products.



# Ⓑ BUFFALO BOLT COMPANY

**NORTH TONAWANDA, N. Y. · SALES OFFICES IN PRINCIPAL CITIES**

***Export Sales Office: Buffalo International Corp., 50 Church Street, New York City***




# Unique RED LEAD "Soaps" ... check Rusting 3 Ways

Scientific research shows why Red Lead has long been regarded as the "standard" metal-protective paint.

One interesting factor is Red Lead's ability to react with the vehicle and produce unique lead "soaps."

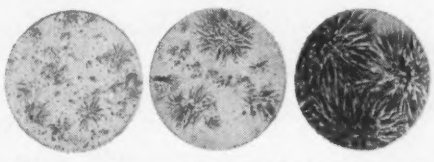
These "soap" formations grow to form a tough, impervious, intermeshing matrix within the paint film, as shown in the photomicrographs below. These "soaps" help Red Lead inhibit rust three ways.

**1. Toughen Paint Film.** Radiating from central cores the "soap" formations develop long, rod-like projections, which spread out and interlock. Thus, they form a dense intermeshing structure that *mechanically* reinforces and toughens the paint film.

**2. Make Film Water-Resistant.** The very structural formation of these "soaps," with their thick, impervious matrix of closely-knit fibres, helps restrict the passage of moisture through the paint film. And metal cannot rust without the presence of moisture.

**3. Keep Film Flexible.** The "soap" formations, far from being rigid, allow movement all along their soft, intertwining projections. The resulting flexibility helps prevent the ruptures to which a hard, unyielding paint film is subject. Thus the lead "soaps" aid in maintaining the continuity of the paint film.

Lead "soaps" form primarily in the dry paint film as it ages. This is where the "soap" formations impart their greatest benefits. When a paint film weathers and ages, decomposition products of the vehicle are formed. Red Lead's ability to slowly combine with these decomposition products actually enhances the life of the paint film. Red Lead's slow rate of reaction means the film age-hardens at a slower rate. It thus retains a high degree of flexibility, a great factor in its lasting adhesion.



*The photomicrographs above show how Red Lead "soaps" progressively spread out as they grow and thus reinforce the paint film.*

Remember, too, Red Lead is compatible with practically all vehicles commonly used in metal protective paints, including fast-drying resin types.

**Specify RED LEAD for ALL Metal Protective Paints**

The rust-resistant properties of Red Lead are so pronounced that it improves *any* metal protective paint. So, no matter what price you pay, you'll get a better paint if it contains Red Lead.

* * *

*The benefit of our extensive experience with metal protective paints for both underwater and atmospheric use is available through our technical staff.*

**NATIONAL LEAD COMPANY:** New York 6; Buffalo 3; Chicago 8; Cincinnati 3; Cleveland 13; St. Louis 1; San Francisco 10; Boston 6, (National Lead Co. of Mass.); Philadelphia 7, (John T. Lewis & Bros. Co.); Pittsburgh 30, (National Lead Co. of Pa.); Charleston 25, W. Va., (Evans Lead Division).

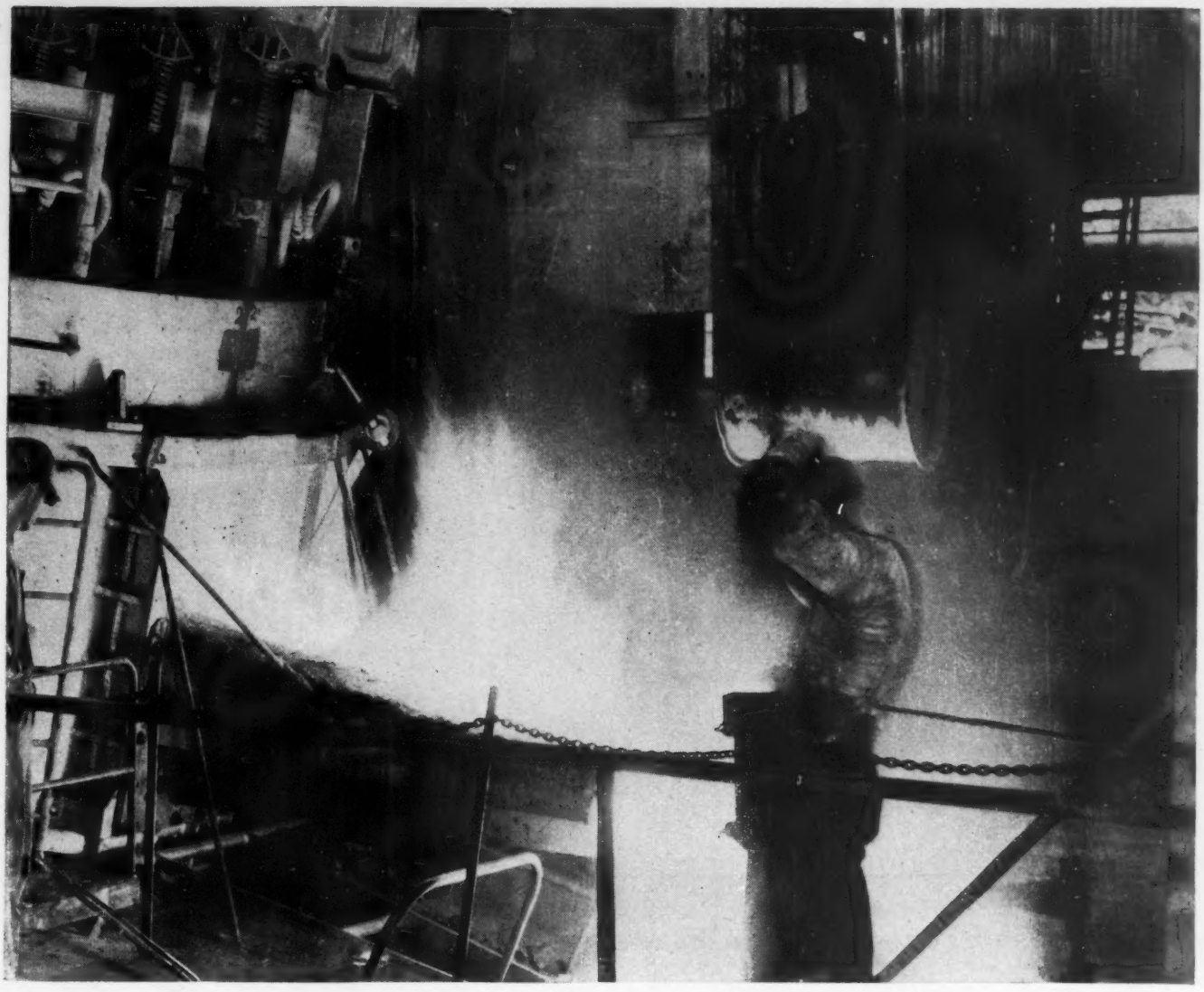
**DUTCH BOY**
Reg. U.S. Pat. Off.
**RED LEAD**

# How to increase Basic Electric Steel Output...

## AT NO EXTRA COST

21 Large electric steel makers use **FERROCARBO-S** for faster heats—better slag manipulation

**FERROCARBO-S** is an efficient, economical ladle deoxidizing agent used in making higher quality open hearth and electric furnace steel.



From 15 to 45 minutes reduction in furnace time during the finishing period of heats properly worked at meltdown is directly attributed to FERROCARBO-S. That is the experience of 21 large basic electric furnace steel producers.

Acting in the slag in atomic form, the constituents of FERROCARBO-S provide more rapid and efficient deoxidation. This is assured by the instability of this specially processed deoxidizing agent. Slags remain carbidic throughout the heat—require very little attention. Furnace atmosphere also remains highly reducing. Practically all free carbon is in solution. Slags are manipulated easier. Good slag conditions are maintained at all times with minimum effort and supervision.

Getting such outstanding results, users enthusiastically endorse FERROCARBO-S as a slag conditioner. Their experience may be duplicated in your operation. Secure full data now by writing Department J-107, The Carborundum Company, Refractories Division, Perth Amboy, New Jersey.

**FERROCARBO-S**

**BY CARBORUNDUM**

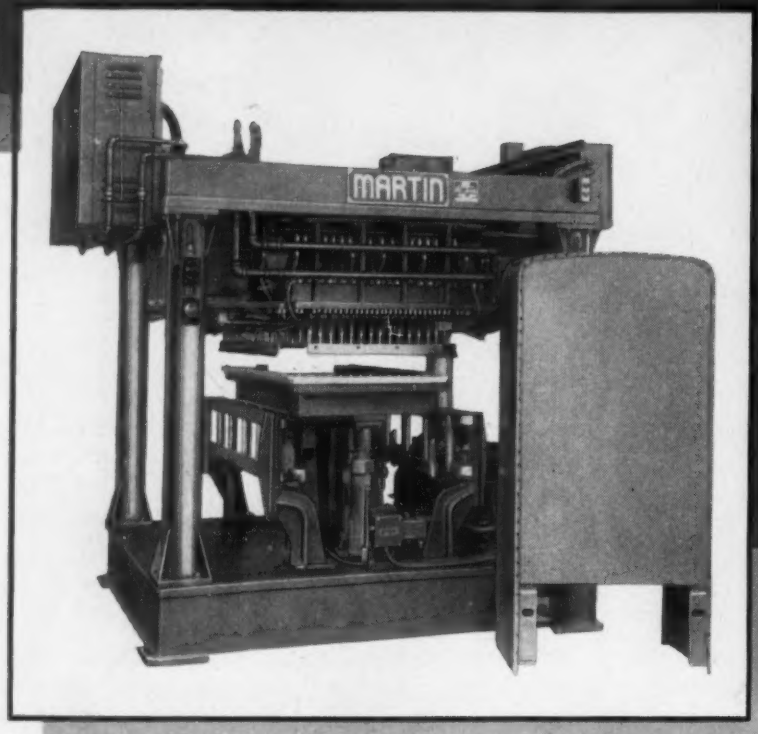
TRADE MARK

FERROCARBO Distributors: Kerchner, Marshall & Co., Pittsburgh, Cleveland and Birmingham; Miller and Company, Chicago, St. Louis and Cincinnati

*"Carborundum" and "Ferrocarbo" are registered trademarks which indicate manufacture by The Carborundum Company*

# WHEN YOU PLAN PRODUCTION SPOT WELDING.....

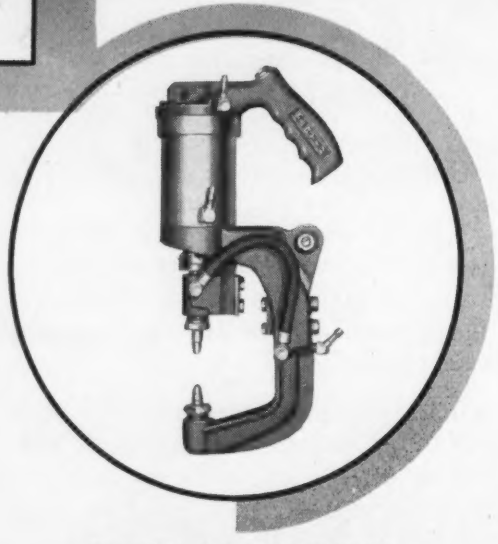
INVESTIGATE THIS MULTIPLE TRANSFORMER AUTOMATIC WELDING PRESS by ·MARTIN·




MARTIN PRESS REQUIRES 12 SECONDS TO WELD THE BACK PANEL TO SHELL OF REFRIGERATOR CABINET —72 WELDS, LOADING AND UNLOADING INCLUDED

Martin High Speed Automatic Welding Presses are designed for high-production spot welding of sheet metal assemblies. Automatic operation plus simultaneous welding of all spots increase welding speeds to revolutionary new figures. Welding dies are interchangeable, permitting use of the press on many different jobs. Presses are manufactured in several designs and sizes.

Before scheduling spot welding operations, investigate the high production rates and profitable versatility of Martin welding equipment. Write for literature and the address of your Martin representative.



MARTIN AIR AND HYDRAULIC SPOT WELDING GUNS FEATURE ROLLING SHUNT, ELIMINATING CABLE KICK

MANUFACTURERS OF QUALITY WELDING EQUIPMENT FOR 20 YEARS

## ·MARTIN·

ELECTRIC COMPANY

3040 EAST OUTER DRIVE • DETROIT 12, MICHIGAN

*a reminder*

## to those who build, buy, or use Electrical Equipment

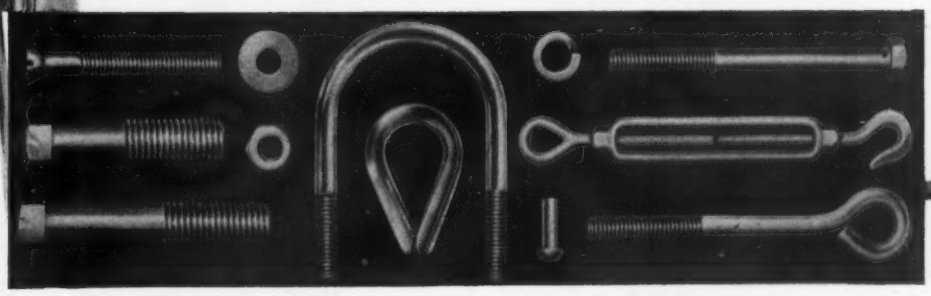
IN general, electrical equipment represents a substantial investment. To guard against costly service interruptions, the many items of poleline hardware, connectors and similar accessories should possess the utmost in dependability. These accessories, while representing a very small part of the total cost, must withstand a relatively large part of the operating burden.

The American Brass Company has developed a number of copper alloys that have proved outstandingly successful in providing the strength and toughness required to withstand gale and storm conditions and ever-changing temperatures... and to resist the corrosive action of industrial gases and vapors, saline seaboard fogs and humid gulf coast atmospheres. Some typical applications of these Anaconda Metals appear on the following page.

47110

**THE AMERICAN BRASS COMPANY**

*General Offices:* Waterbury 88, Connecticut
Subsidiary of Anaconda Copper Mining Company
*In Canada:* ANACONDA AMERICAN BRASS LTD., *New Toronto, Ont.*



Millions of Everdur* bolts, connectors, and similar accessories are now in daily service, reducing replacement costs and failure of structural members.

*Reg. U.S. Pat. Off.

ANACONDA
from mine to consumer

*Anaconda Copper & Copper Alloys*

# Products serve better... last longer

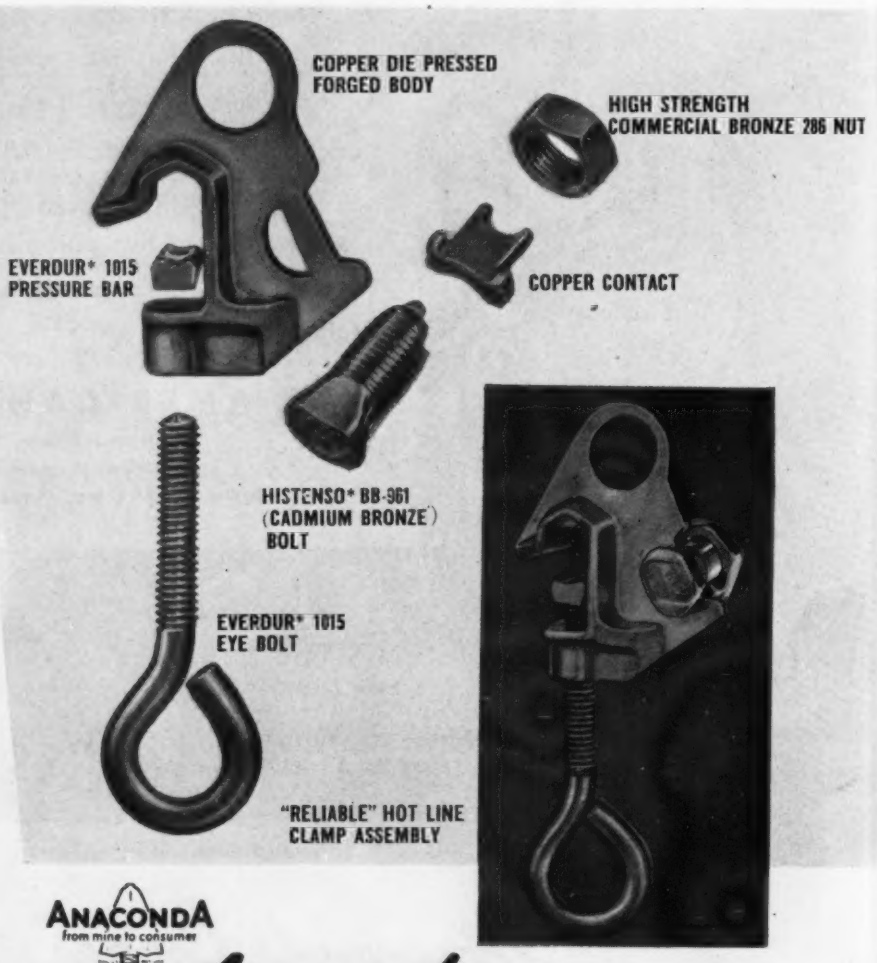
## when the right metal goes into the right place

Here are two examples, both supplied through the courtesy of the Reliable Electric Company, Chicago.

Each of the metals used was selected in the alloy which contributes a *combination* of the most desirable properties. The metals for the component parts meet all requirements for workability and machinability... while the assembled units provide the necessary high strength, vibration and corrosion resistance, and high electrical conductivity.

Next time you get to the stage of "specifying metals" call on us. Our Technical Department will be glad to work with you.

**THE AMERICAN BRASS COMPANY**
*General Offices:* Waterbury 88, Connecticut


COPPER DIE PRESSED FORGED BODY
HIGH STRENGTH COMMERCIAL BRONZE 286 NUT
EVERDUR* 1015 PRESSURE BAR
COPPER CONTACT
HISTENSO* BB-961 (CADMIUM BRONZE) BOLT
EVERDUR* 1015 EYE BOLT
"RELIABLE" HOT LINE CLAMP ASSEMBLY

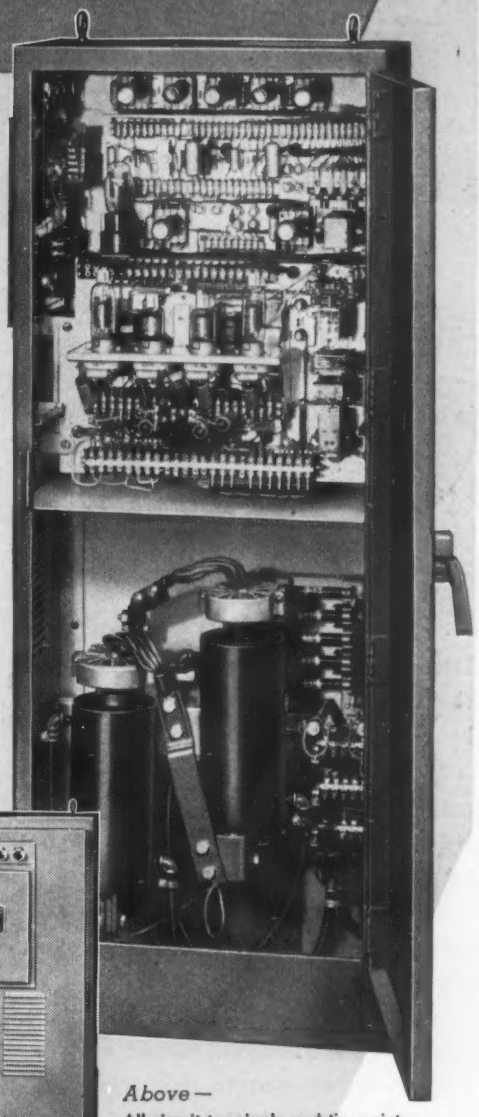
ANACONDA
from mine to consumer

*Anaconda*
**COPPER and COPPER ALLOYS**

# NOW *Electronic* WELDER CONTROL designed to INDUSTRIAL STANDARDS

PART OF THE FLOOD OF NEW DESIGNS

***NEW** Square D Class 8993 combination controllers **for resistance welders** incorporate, in one enclosure, electronic contactor, heat control, synchronous-precision weld timer, and sequence panel. They provide accurate time and current measure recommended for welding non-ferrous metals, stainless steels, small parts and other critical jobs.*



### IMPORTANT NEW CONSTRUCTION FEATURES

- All terminal connections and tie points are made accessible by opening main door and swinging out weld time panel.
- Simple tools—screw-driver and pliers—can be used to replace components. Number of soldered connections is minimized.
- Functional sub-panels (contactor, heat control, timing, and sequencing) have separable connectors—may be quickly removed or replaced.
- Designed for mounting on side of machine or for wall mounting.

### IMPORTANT NEW CIRCUIT FEATURES

- New separate excitation circuit for ignitrons makes firing independent of voltage or load current. Firing pulses have consistent amplitude and duration for all heat control settings from 20% to 100% current.
- Synchronous-precision weld timing circuit operates on new differential discharge principle. Voltage changes before or during the weld have no effect on timing accuracy.
- All-electronic circuit has no sequencing relays and is of simplified design. For maximum safety, air valve is energized by a magnetic contactor. A no-weld relay disconnects firing tube anodes only in response to no-weld and water-flow switches, and warm-up timer.
- Coupling transformers isolate functional sections of circuit for maximum safety and efficiency. Initiating, no-weld, and pressure switch circuits are 110 volts.

*Above—*
All circuit terminals and tie points accessible by opening main door and swinging out sequence panel.

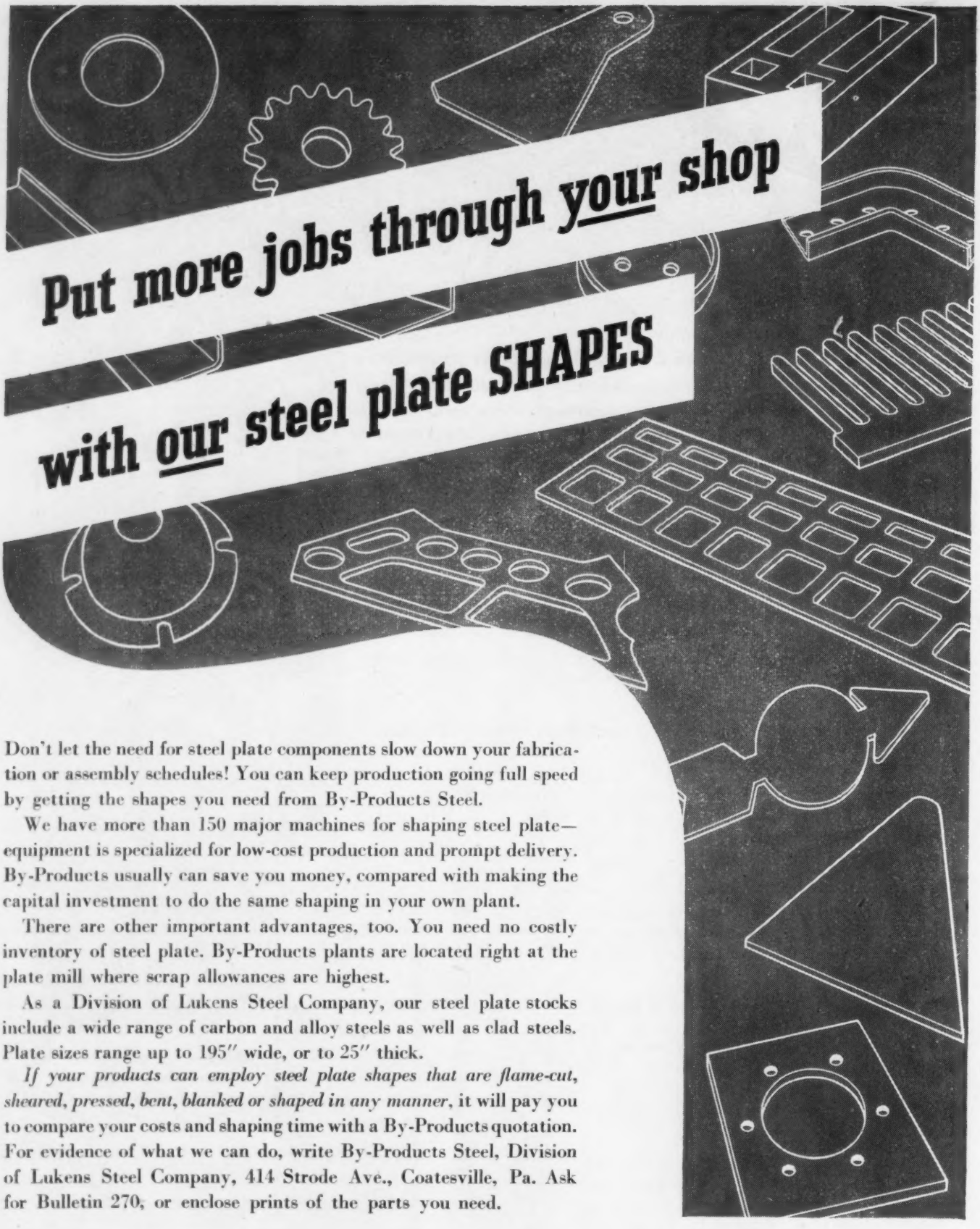
*Left—*
Controller can be arranged either for side of machine mounting or wall mounting.

***Write** for Bulletin 208 • Square D Company • 4041 N. Richards St. • Milwaukee 12, Wisconsin*

**SQUARE D COMPANY**

DETROIT • MILWAUKEE • LOS ANGELES

SQUARE D CANADA, LTD., TORONTO, ONTARIO • SQUARE D de MEXICO, S.A., MEXICO CITY, D.F.



# Put more jobs through your shop with our steel plate SHAPES

Don't let the need for steel plate components slow down your fabrication or assembly schedules! You can keep production going full speed by getting the shapes you need from By-Products Steel.

We have more than 150 major machines for shaping steel plate—equipment is specialized for low-cost production and prompt delivery. By-Products usually can save you money, compared with making the capital investment to do the same shaping in your own plant.

There are other important advantages, too. You need no costly inventory of steel plate. By-Products plants are located right at the plate mill where scrap allowances are highest.

As a Division of Lukens Steel Company, our steel plate stocks include a wide range of carbon and alloy steels as well as clad steels. Plate sizes range up to 195″ wide, or to 25″ thick.

*If your products can employ steel plate shapes that are flame-cut, sheared, pressed, bent, blanked or shaped in any manner*, it will pay you to compare your costs and shaping time with a By-Products quotation. For evidence of what we can do, write By-Products Steel, Division of Lukens Steel Company, 414 Strode Ave., Coatesville, Pa. Ask for Bulletin 270, or enclose prints of the parts you need.

**LUKENS**
BY-PRODUCTS DIVISION
★

## BY-PRODUCTS STEEL PLATE SHAPES

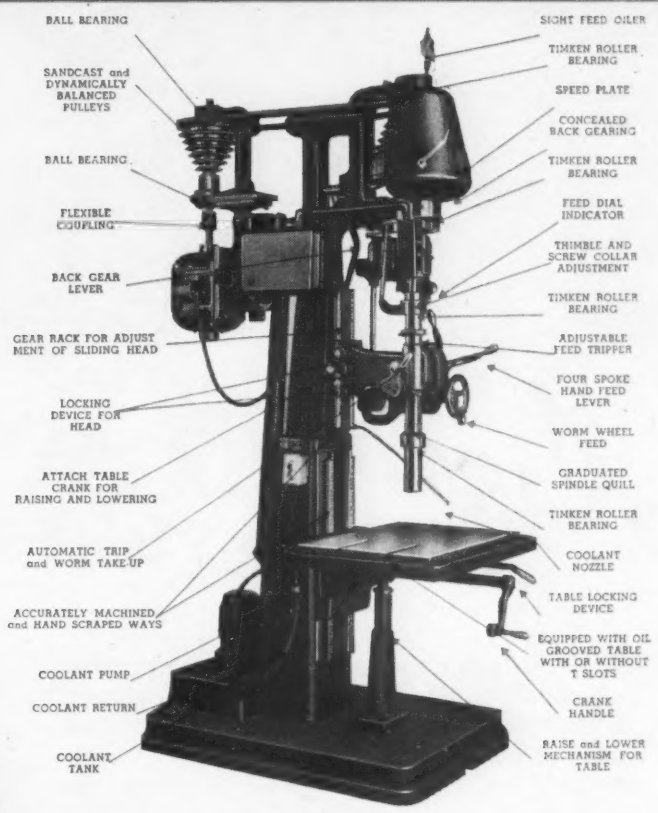
FLAME-CUT ★ SHEARED ★ PRESSED ★ BENT ★ BLANKED ★ WELDED

# Canedy-Otto

## SLIDING HEAD BOX TYPE

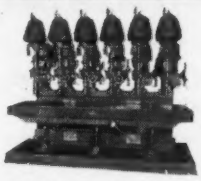
# FLOOR DRILLS

Designed to provide an accurate, fast, sturdy, dependable drill for a moderate initial investment and low maintenance cost. Unit is equipped with anti-friction ball bearings; all castings are seasoned and sturdy; all gears of high alloy steel, accurately machined; all surfaces are hand scraped to a minimum tolerance. Available with V-belt drive — 16 spindle speeds. Power feed of positive, gear driven type. Four rates of feed are obtained through dial knob indicator. Automatic stop for predetermined depth drilling. 21" size — 1½" capacity.




*SINGLE SPINDLE MODEL*

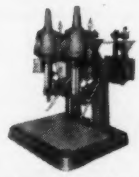
**21" Box Column Sliding Head Floor Drill**



**6-Spindle 21" Box Column Sliding Head Floor Drill**

**4-Spindle 21" Box Column Sliding Head Floor Drill**

**16" No. 3000 F.V. 1-Spindle Box Column Floor Drill**



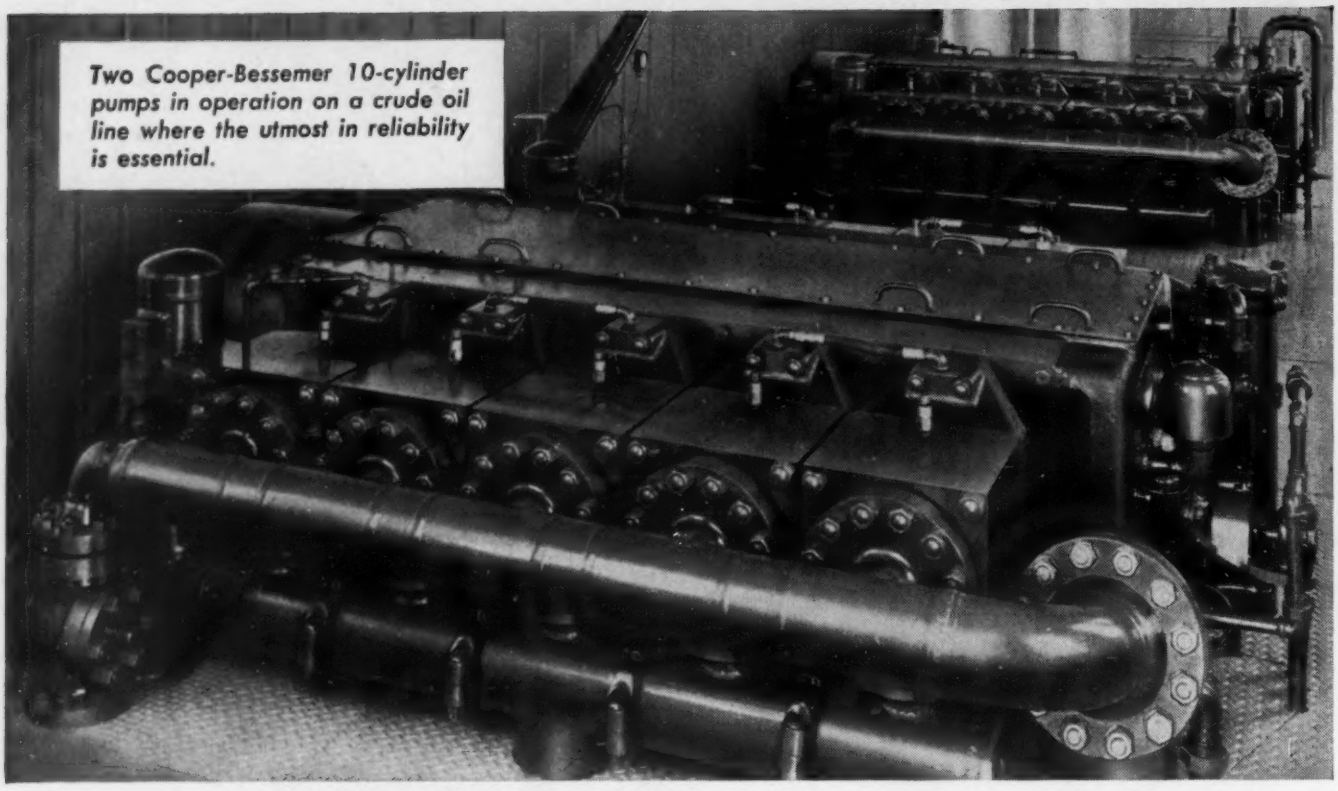
**16" No. 5—10,000 R.V 2-Spindle Bench Drill**

**14" No. 3000 F.V. 1-Spindle Sensitive Floor Drill**

Standardize on CANEDY-OTTO drill presses throughout your shop. The completeness of the CANEDY-OTTO line enables you to do this — to fill all your requirements from this one source. So write today for our catalog describing in detail the many drill presses that bear the CANEDY-OTTO trade-mark — your guarantee of greater value, since 1892.

## CANEDY-OTTO MFG. COMPANY

**Designers & Manufacturers of the World's Most Complete Drill Press Line**
**CHICAGO HEIGHTS, ILLINOIS**



*Two Cooper-Bessemer 10-cylinder pumps in operation on a crude oil line where the utmost in reliability is essential.*

# *Announcing* REVOLUTIONARY LIQUID PUMPS *by Cooper-Bessemer*

After five full years of development and intensive testing, Cooper-Bessemer Twin-Line liquid pumps are now available for all services where liquid is to be pumped against high pressures. Fully proved, these heavy-duty units are truly revolutionary — in construction . . . in housing and maintenance economy . . . and in low overall operating cost!

Built in 2, 4, 6, 8 and 10 cylinder sizes, Cooper-Bessemer Twin-Line pumps are designed for capacities from 2400 to 50,000 barrels a day at discharge pressures from 500 to 2000 psi.

Here are only a few of the major advantages they offer you:

**1.** Tremendous weight and space savings compared with all other reciprocating pumps of equivalent capacity!

**2.** A normal operating speed of 400 rpm, permitting the simplicity and economy of a direct-connected engine drive!

**3.** Sensational savings afforded by mechanical efficiencies exceeding 92%, and volumetric efficiencies from 93 to 96% !

**4.** Extremely wide capacity range through the use of variable plunger sizes and changes of engine speed!

**5.** Removal and replacement of any single pump cylinder without disturbing the other cylinders!

**6.** Unequaled accessibility of all liquid end parts requiring maintenance!

These important advantages and many others are explained fully in our new Twin-Line liquid pump bulletin. Why not send now for your copy. Or, get in touch with our nearest office for engineering data on how these revolutionary pumps will fit into your particular plans.

*The* **Cooper-Bessemer** *Corporation*

***MOUNT VERNON, OHIO — GROVE CITY, PENNA.***

New York Washington Bradford, Pa.
Parkersburg, W. Va. San Francisco, Calif. Houston, Dallas, Greggton, Pampa and Odessa, Texas
Seattle, Wash. Tulsa Shreveport St. Louis Los Angeles Caracas, Venezuela

# Cabinet Meeting –

**EVERY WORKDAY RIVERSIDE'S TOP EXECUTIVES MEET TO OPEN, CONFER AND ACT UPON YOUR MAIL.**

For the past 25 years Riverside has *daily* conducted a singular and most effective industry conference. Around a table sit the top operating men of every department concerned with the handling of an order, from acceptance to shipment.

All questions and problems in *each* letter, inquiry or order in that day's mail receive the full *consideration* of Riverside's Executive Officer, Chief Metallurgist, Works Manager, General Sales Manager, Mill Superintendent, Advertising Manager and Order Department Manager.

By airing freely the *details* of each problem, a complete agreement is quickly obtained and immediate action taken. Result: faster handling of all correspondence, prompt entry of orders into production schedule, and, best of all, days are lopped off lead time. Customers say (emphatically) that they like this friendly, personal attention and cooperation. It prevents misunderstandings, saves time, money, tempers.

Riverside alloys . . . *Phosphor Bronze, Nickel Silver* and *Beryllium Copper* are produced to specification. Do what many of our customers do daily, consult us about your individual requirement. We'll be glad to help. Call or write us today.

BIG ENOUGH TO BE HELPFUL • SMALL ENOUGH TO BE FRIENDLY

## THE RIVERSIDE METAL COMPANY

**RIVERSIDE, NEW JERSEY**

NEW YORK, CHICAGO, HARTFORD, CLEVELAND

**RIVERSIDE**

PHOSPHOR BRONZE
NICKEL SILVER
BERYLLIUM COPPER

# EATON PERMANENT MOLD GRAY IRON CASTINGS

## *are Ideal for Machine Tool Parts*

For a wide range of applications in the machine tool industry Eaton Permanent Mold Gray Iron Castings provide an ideal combination of physical characteristics. High tensile strength and ability to withstand shock are naturally prime requirements. Their dense non-porous structure, assuring freedom from leakage, recommends them particularly for hydraulic control and equipment parts. Face plates, vee-blocks, and other precise units can be lapped flat with assurance that they will not warp or distort after machining.

Eaton Permanent Mold Gray Iron Castings provide gear blanks with a uniformly dense close-grained structure, assuring free machinability and the holding of close tolerances in tooth dimensions.

Eaton Foundry Division engineers will be glad to discuss the application of Eaton Permanent Mold Gray Iron Castings to your product.

Send for your copy of the illustrated booklet, *"A Quick Picture of the Eaton Permanent Mold Process for producing Gray Iron Castings."*

THE EATON PERMANENT MOLD MACHINE IS A SYMBOL OF THE QUALITY OF GRAY IRON CASTINGS PRODUCED BY THE PERMANENT MOLD PROCESS.

**EATON**

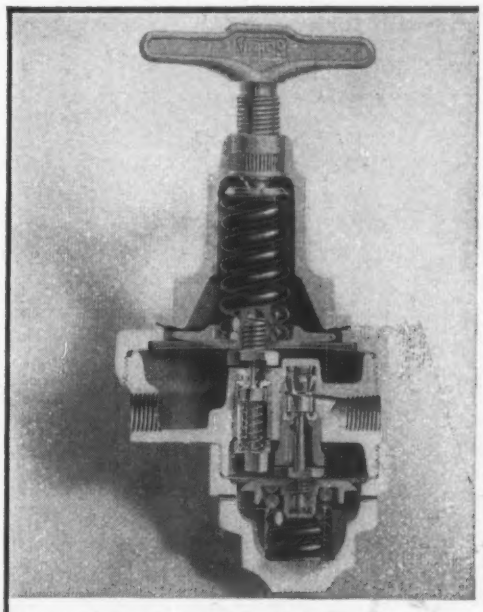
**MANUFACTURING COMPANY**

**FOUNDRY DIVISION**

9771 French Road • Detroit 13, Michigan

*Made by* ····· VICTOR

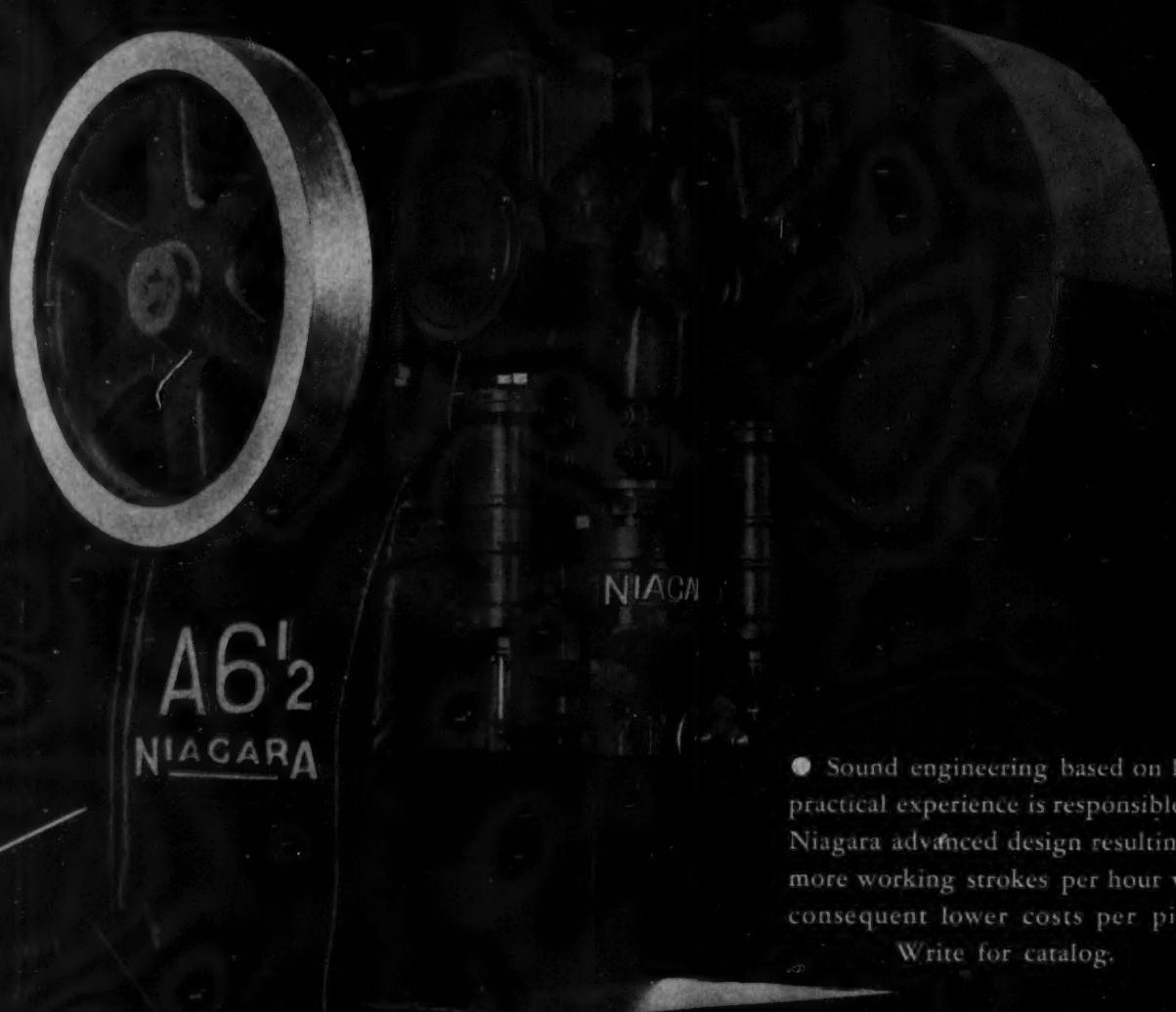
proper control of gas pressures safeguards gas or compressed air operated tools and, when welding or cutting torches are involved, fine pressure reducing regulators conserve gases and safeguard operators. single or two-stage reduction regulators for all types of cylinder gases or cylinder manifolds . . . for very small or very large hourly gas volume . . . are made by victor . . . and it's more than a slogan that victor welding and cutting equipment costs less to own and to operate. victor equipment company, san francisco 7, calif.



what's under the hood is what makes the automobile go . . . what's inside of a regulator determines its true value.

197

MEN RESPONSIBLE FOR PRODUCTION DEPEND O




● Sound engineering based on long practical experience is responsible for Niagara advanced design resulting in more working strokes per hour with consequent lower costs per piece. Write for catalog.

NIAGARA MACHINE & TOOL WORKS, BUFFALO 11, NEW YORK

# NIAGARA

# PRESSES
# SHEARS

AND OTHER MACHINES
FOR MAKING MORE THINGS
FOR MORE PEOPLE

DISTRICT OFFICES—NEW YORK • CLEVELAND • DETROIT

# Direct VEEDER-READINGS

**Save Costly Hours and Errors on all types of Products and Production Machines**

NO DIALS TO READ: No "pointer-to-dial" reading to invite errors.

NO "INTERPRETER" NEEDED: Veeder-Readings are *direct* . . . nothing to translate or decode. And the bold, black-and-white figures are *easy* to read.

NO TIME LAG: Veeder-Readings are *up-to-the-minute* . . . give you the whole story on production *as of now.*

NO TIME LIKE THE PRESENT: *Now's* the time to find out how Veeder-Root *Count*rol can count to *your* advantage, in your plant or in your product . . . *or both.* Write.

## VEEDER-ROOT INC.

**HARTFORD 2, CONNECTICUT**

*In Canada:* Veeder-Root of Canada, Ltd., 955 St. James St., Montreal 3.
*In England:* Veeder-Root Ltd., Dickinson Works, 20 Purley Way, Croydon, Surrey.

# BOTTOM TROUBLES:

Junior's little bottom has snagged upon a fence,
so Grandma's fancy patchwork restores his elegance.
But when a *furnace* bottom does *not* burn through,
the chances are it's MAGDOLITE to which the credit's due.

Years ago Baker's MAGDOLITE began warring on Open Hearth bottom troubles and has been waging a full-scale offensive ever since. The tide of battle has become so favorable that more and more steel companies have joined the ranks of MAGDOLITE users in an all-out drive to lick holes, the greatest enemy of Open Hearth and Electric furnaces. Enlistment is still open . . . join MAGDOLITE'S ranks now for less "out" time—greater profits!

**MAGDOLITE!**

**THE J. E. BAKER COMPANY**

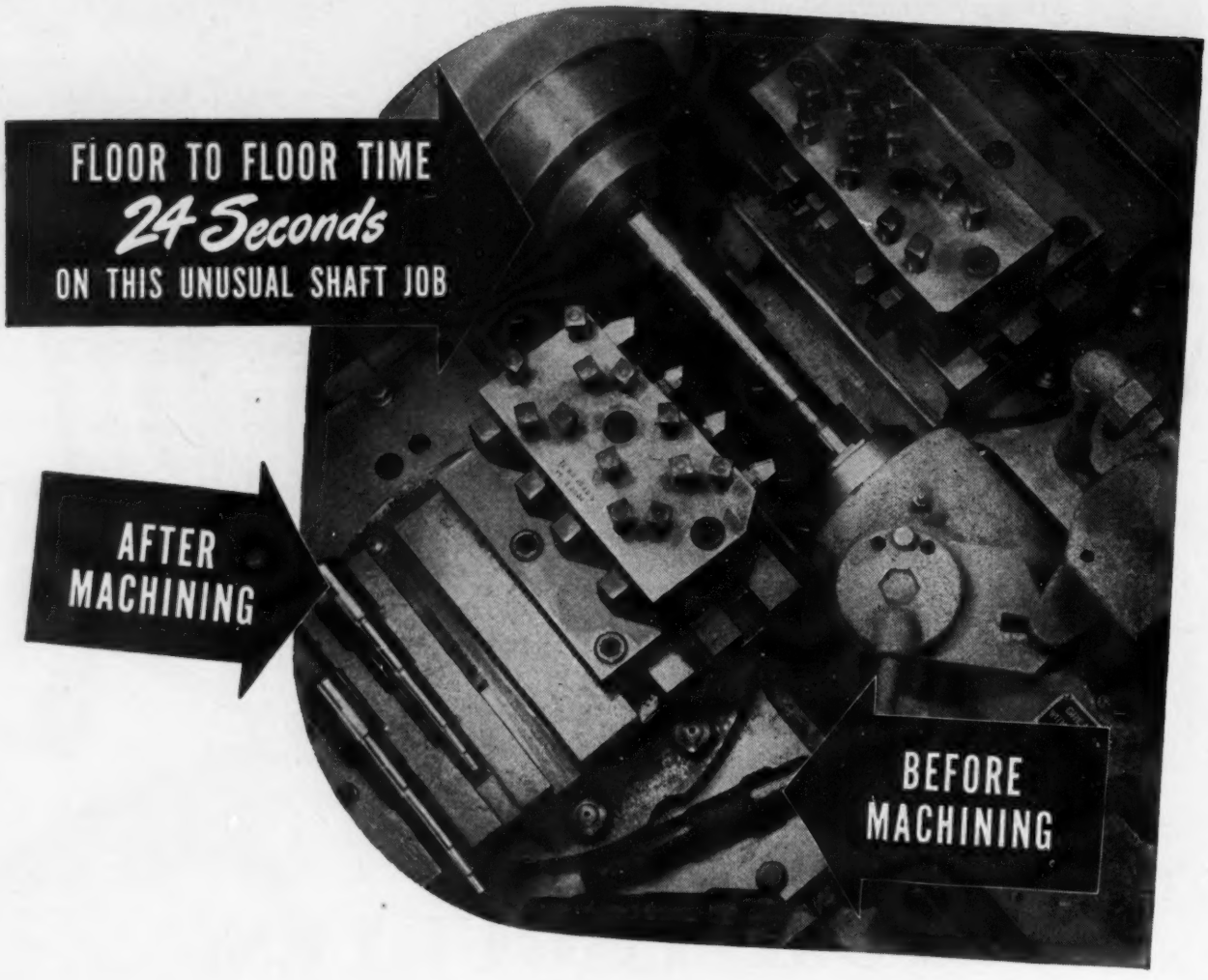
BILLMEYER, PA. YORK, PENNSYLVANIA MILLERSVILLE, OHIO

Magdolite • Low Silica Limestone • Chemical Lime • Fluxing Lime

**5 ways better**
COMPOSITION
QUALITY
STRENGTH
PREPARATION
ECONOMY

**You're always SAFE with BAKER'S MAGDOLITE**

# Do it with a DUOMATIC!

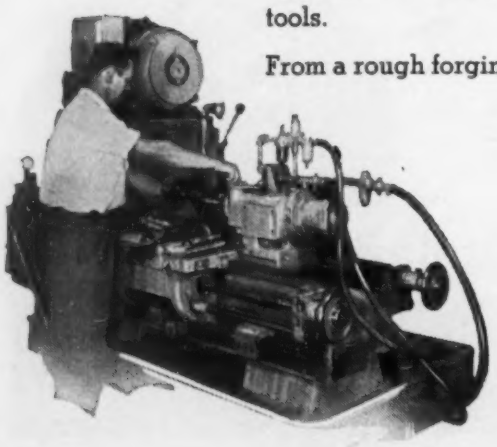



Here is an amazing demonstration of the speed and versatility of the new Lodge & Shipley 2-A Duomatic (automatic) Lathe.

Complete machining of this unique stoker output shaft was obtained . . . turning, necking and chamfering . . . in one operation . . . using nine carbide tipped tools.

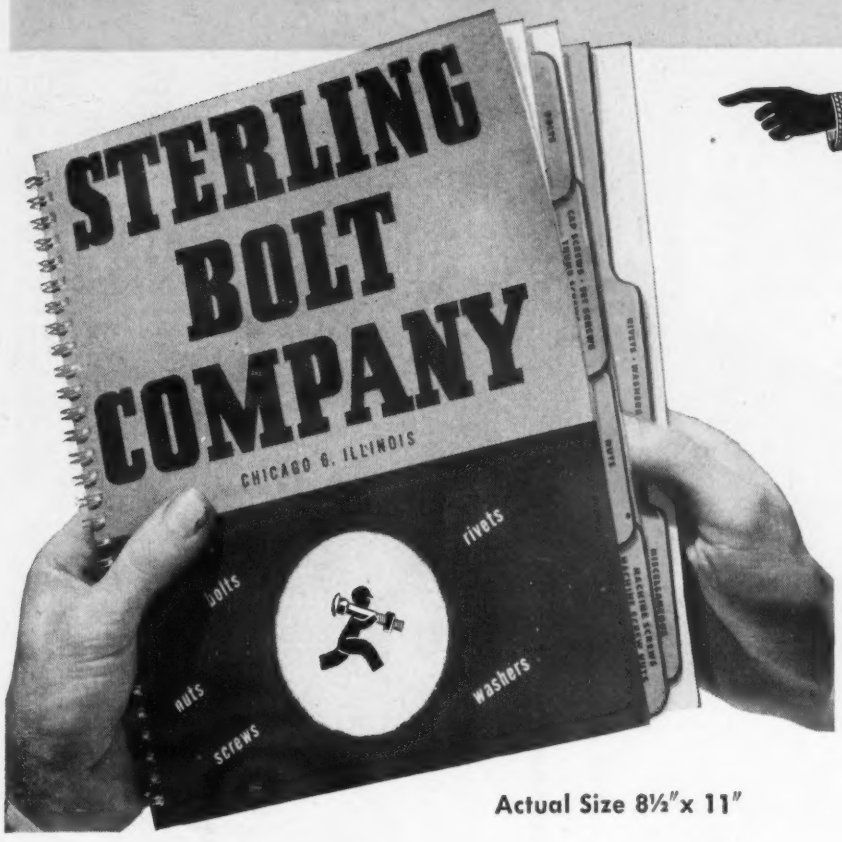
From a rough forging to a finished shaft . . . in 2/5 of a minute. That's production . . . and but a single example of the versatility of the 2-A Duomatic on large or small lots.

Write for the 2-A Duomatic Catalog giving complete details of this amazing new automatic lathe. Lodge & Shipley Engineers will be glad to offer advice on the latest in lathe production methods and equipment without obligation.



THE Lodge & Shipley COMPANY
CINCINNATI 25, OHIO
MACHINE TOOL DIVISION • 3055 COLERAIN
SPECIAL PRODUCTS DIVISION • 800 EVANS ST.

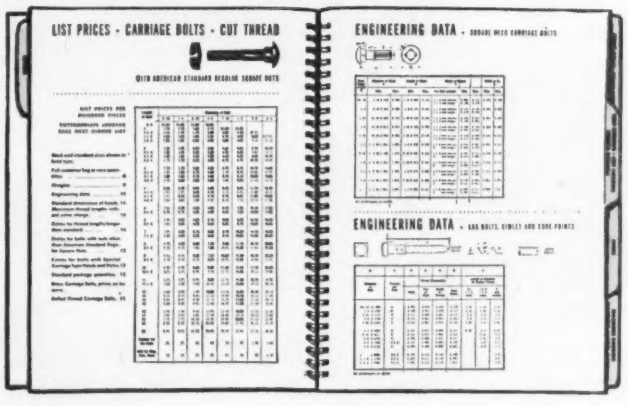
# THIS FREE BOOK CONTAINS ALL THE INFORMATION YOU NEED FOR EFFECTIVE METAL FASTENING BUYING




Actual Size 8½" x 11"

## THUMB INDEXED IT'S EASY TO USE

You'll want the new Sterling Bolt "Fastening Buyer's Handbook" for everyday reference. It's crammed cover-to-cover with technical information, engineering data and list prices covering virtually every one of the 200,000 metal fastening items used in every industrial field—all kinds of bolts, nuts, screws, rivets, washers and special fasteners. This wealth of information has been compiled into logical categories—in 124 full size pages—illustrated with photographs and mechanical drawings—set in large, easy-to-read type—each category thumb indexed for quick reference. It is a ready reference handbook for every bolt and nut buyer. Send for your copy today.




*During these times of scarcity, you may find items available in our stocks which would help you through production problems. Inform us of your needs and write for a copy of our current stock list.*

**STERLING BOLT CO.**
207 W. JACKSON BLVD.
CHICAGO 6, ILL., HAR. 9880

SALES OFFICES:
Union Trust Bldg., Cincinnati 2, Ohio
17 W. Market St., Indianapolis 4, Indiana
161 W. Wisconsin Ave., Milwaukee 3, Wisconsin
1228 N. Hadley Street, St. Louis 6, Missouri

## MAIL THIS COUPON TODAY FOR YOUR FREE FASTENER HANDBOOK

STERLING BOLT COMPANY
207 West Jackson Boulevard, Chicago 6, Illinois

Please send me, without obligation, a copy of your new easy to use catalog. Please print.

NAME_____

POSITION_____

FIRM_____

ADDRESS_____

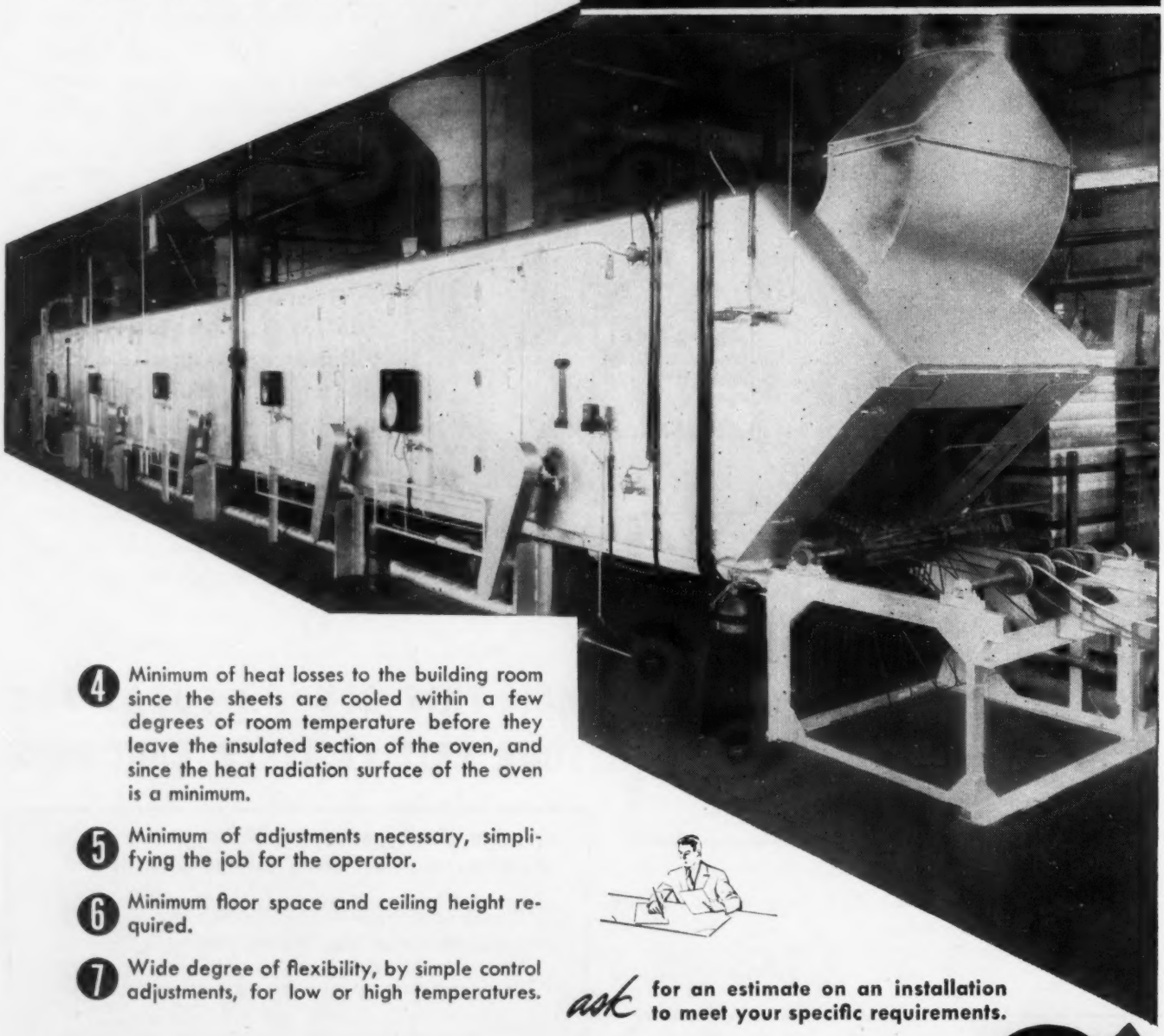
CITY_____ STATE_____

# *Important Improvements* IN Metal Decorating Oven

**The new Young Brothers metal lithographing oven is designed to take full advantage of rapid heat input and heat recuperation, rapid cooling and automatic unloading.**

***The following are some of its outstanding advantages:***

1. Higher speed, and consequently more uniform heating of the work, reducing the overall length of the equipment required.
2. Greater fuel economy, utilizing recuperative cooling.
3. Extremely high degree of uniformity while the sheets are at operating temperature.



4. Minimum of heat losses to the building room since the sheets are cooled within a few degrees of room temperature before they leave the insulated section of the oven, and since the heat radiation surface of the oven is a minimum.
5. Minimum of adjustments necessary, simplifying the job for the operator.
6. Minimum floor space and ceiling height required.
7. Wide degree of flexibility, by simple control adjustments, for low or high temperatures.



*ask* **for an estimate on an installation to meet your specific requirements.**

## Young Brothers Company

6503 MACK AVENUE • DETROIT 7, MICHIGAN

YB CD ESTABLISHED IN 1896

# THIS WISSCO WIRE IS A *Free Loader* WITH A STRONG BITE

*Illustration of Swing-line Stapler courtesy Speed Products Co., Inc., Long Island City, N. Y.*

Speed Products' 100% Round Wire Staples are famous for their non-clogging quality, because they are free of excess glue. They are made of round wire of uniform temper, tensile strength and size, so that staples will take an even bend on wire-forming machines and will penetrate paper without jamming the stapler.

The Wissco Preformed Staple Wire used by Speed Products Co., Inc. is a steel wire with galvanized finish, having a tight bond that doesn't peel off during forming operations or in final use.

Wickwire Spencer's ability to produce this and innumerable specialty wires, stems from 126 years of pioneering in the development of high and low carbon steel wire; round or shaped; in a wide variety of sizes, tempers, grades and finishes.

If you have a problem involving the use of wire, why not write us? Chances are we know the answer. If we don't, our metallurgists will be happy to help you find it, to develop the proper steel formula and have it produced by our skilled craftsmen. Let us know your requirements.

**WISSCO** *Wire*

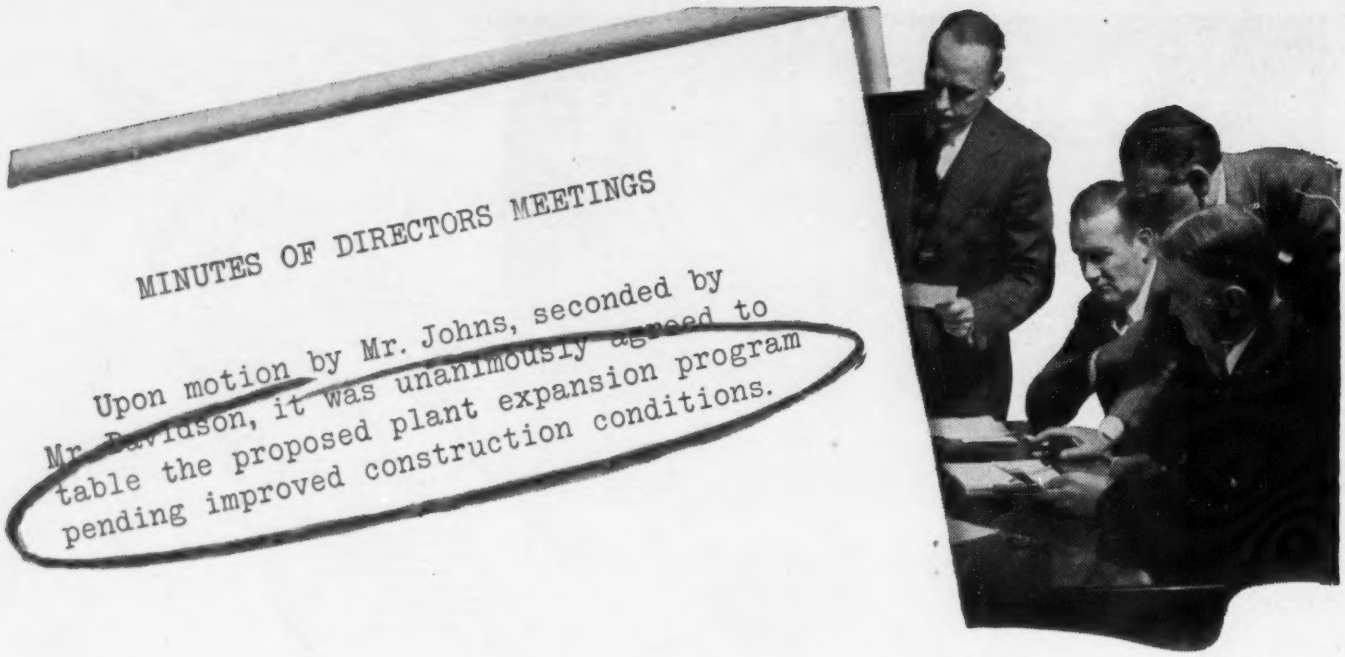
A PRODUCT OF WICKWIRE SPENCER STEEL DIVISION · THE COLORADO FUEL AND IRON CORPORATION

WIRE SALES OFFICE—361 DELAWARE AVE., BUFFALO 2, N. Y.

EXECUTIVE OFFICE—500 FIFTH AVE., NEW YORK 18, N.Y. · SALES OFFICES—BOSTON·CHICAGO·DENVER·NEW YORK

PACIFIC COAST SUBSIDIARY—THE CALIFORNIA WIRE CLOTH CORP., OAKLAND 6, CAL.

CF&I


MINUTES OF DIRECTORS MEETINGS
Upon motion by Mr. Johns, seconded by
Mr. Davidson, it was unanimously agreed to
table the proposed plant expansion program
pending improved construction conditions.

# You don't *have* to do that, Gentlemen...

## INVESTIGATE READY-BUILT, READY-TO-OCCUPY PRODUCTION FACILITIES AVAILABLE NOW

To be sure, building materials *are* still short. Equipment deliveries *are* delayed. Other new-construction "headaches" continue to interfere with plant expansion plans, branch manufacturing or distribution relocation programs and the establishment of new enterprises.

But many industrialists and management executives have found a practical way to carry out their plans. They have solved their problems by purchase or lease of Government-owned industrial facilities . . . at money-saving prices.

Hundreds of good, usable, strategically-located plants and properties are available now. Small-town plants down South, big-city establishments in the Midwest, land and buildings on Atlantic, Pacific and Gulf coasts. One or more of these may be just right for you, or readily and economically adaptable to your needs.

So, before you "table" your plans, investigate the facilities ready and waiting for you to bid on today. Check the offerings listed in the new Plantfinder—consult our nearest office for further information.

**NEW PLANTFINDER—FREE...** Describes immediately available properties—lists others soon to be made available—indexed, cross-indexed for your convenience. Write for free copy—to the address listed below, on your company letterhead, please.

**WAR ASSETS ADMINISTRATION**
**OFFICE OF REAL PROPERTY DISPOSAL**

GOVERNMENT WAA SURPLUS

930-4

**ROOM 307—425 SECOND STREET, N.W., WASHINGTON 25, D. C.**

*Regional Offices:* Atlanta • Birmingham • Boston • Charlotte • Chicago • Cincinnati • Cleveland • Denver Detroit • Grand Prairie, Texas • Helena • Houston • Jacksonville • Kansas City, Missouri • Little Rock Los Angeles • Louisville • Minneapolis • Nashville • New Orleans • New York • Omaha • Philadelphia Portland • Richmond • St. Louis • Salt Lake City • San Antonio • San Francisco • Seattle • Spokane • Tulsa

# EFFICIENCY . . .

*right down the line*

## WITH SIMONDS ABRASIVE GRINDING WHEELS

**SIMONDS ABRASIVE CO.**

SIMONDS ABRASIVE COMPANY
*is a division of*
SIMONDS SAW AND STEEL CO.
Fitchburg, Mass.
Saws, Machine Knives, Files

*Other Divisions:*

SIMONDS STEEL MILLS
Lockport, N. Y.
Special Steels

SIMONDS CANADA SAW CO. LTD.
Montreal, Can.
Simonds Products for Canada

**Precision manufacture, proved performance, easy selection. These features of Simonds Abrasive's complete grinding wheel line mean fast action, lasting efficiency, fewer dressings all along your grinding production line. Learn how you can line up top results with Simonds Abrasive Grinding Wheels, Mounted Wheels and Points, Segments, Grains, Bricks and Sticks. Send now for free Data Book. Meanwhile, for your immediate wheel needs consult your nearest Simonds Abrasive Distributor who carries complete stocks.**

**SIMONDS ABRASIVE COMPANY, TACONY AND FRALEY STREETS, PHILADELPHIA 37, PA.**
**DISTRIBUTORS IN ALL PRINCIPAL CITIES**

# They're the LAST word!

# New!

Copyright 1947, General Electric Co.

## Here is the first major advance in d-c welder design in nearly a decade—General Electric's new WD-40 series of heavy-duty industrial welders.

Into these full capacity, NEMA rated machines, modern design engineering has built *all* the features for *outstanding welding performance and service.* Functional design, efficient use of materials, plus the elimination of "dead-weight" iron and copper, *save approximately 50% in overall size and weight.*

Operating at 3500 rpm, the WD-40 series machines provide the same advantages of service, durability and low maintenance long associated with G-E welders; and in addition, *welding performance is superior* in many ways. The arc is easily struck and maintained, and steady welding current is provided over a broad range.

Their compact, weight-saving design makes them readily portable, saves floor space, and permits utilization of underbench and balcony space not available to larger units.

### NEW CONTROL

Improved single-dial dual control, available only on the G-E WD-40 series, combines the flexibility and precision of dual control with the convenient operation of single dial control. Simple and easy to use, this new simplified control saves time and guess work : : : permits operators to PRE-SET the *correct* current for any given job without subsequent adjustments after the arc is struck.

Yes, modern, functional design has caught up with d-c welders, and you'll probably want to know more about the results—the new WD-40 series machines, manufactured in 200-, 300-, and 400-amp models. Just mail the coupon to your nearest G-E Arc Welding Distributor; why not right now! *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

**G-E WD-40 series welders have been thoroughly tested and production proved. Several hundred of an early prototype, built for the armed forces, established an enviable "war record." And test samples of the present models have been actively production tested for more than two years, right in the plants of many industrials and metal fabricators.**

**GENERAL ELECTRIC**

# D-C ARC WELDERS

## WD-40 SERIES

### G-E ARC-WELDING DISTRIBUTORS

**ALABAMA**—Young & Vann Supply Co., Box 2832, Birmingham; Turner Supply Co., Mobile
**ARIZONA**—Arizona Welding & Equipment Co., 230 So. Central Ave., Phoenix
**CALIFORNIA**—Victor Equipment Co., 844 Folsom, San Francisco
**COLORADO**—Hendrie & Bolthoff Co., 1638 17th, Denver (also WYO.)
**FLORIDA**—Cameron & Barkley Co., Tampa
**GEORGIA**—Chandler Machinery Co., 120 Houston N.E., Atlanta; Georgia Oxygen Co., 321 Fifth, Macon
**IDAHO**—Olsen Manufacturing Co., 2223 Fairview Ave., Boise
**ILLINOIS**—Machinery & Welder Corp., 1324 W. Fulton, Chicago (also MINN. and WIS.)
**INDIANA**—Sutton-Garton Co., 301 West Vermont, Indianapolis; Perry Welding Sales & Service Co., 424 East Monroe, South Bend
**KANSAS**—Watkins, Inc., 204 North Waco, Wichita
**KENTUCKY**—G.E. Supply Corp., Harlan;—Mine Service Co., Lothair; Marine Electric Co., 110 South First, Louisville
**LOUISIANA**—Equitable Equipment Co., 410 Camp, New Orleans; Hughes Welding & Supply Co., Box 116, Shreveport
**MARYLAND**—Arcway Equipment Co., 920 E. Fort Ave. Baltimore (also DEL. and VA.)
**MICHIGAN**—Welding Sales & Engineering Co., 8570 Grinnell Ave., Detroit; Miller Welding Supply Co., 55 Mt. Vernon Ave., Grand Rapids
**MISSOURI**—Hohenschild Welders Sup. Co., 512 E. 18th, Kansas City (also KAN.) Machinery & Welder Corp. 700 So. Spring Ave., St. Louis (also IOWA)
**MONTANA**—Montana Hardware Co., 823 South Montana, Butte
**NEBRASKA**—Lincoln Welding & Supply Co., 330 South 10th, Lincoln; Baum Iron Co., 13th & Harney, Omaha (also IOWA)
**NEW ENGLAND**—Welding Engrng. Sales Corp., 150 Causeway, Boston, Mass.
**NEW MEXICO**—Industrial Supply Co., 104 So. Cornell Ave., Albuquerque
**NEW YORK**—Welding Engineering Sales Corp., 110 E. 42nd St., New York
**NORTH CAROLINA**—National Welders Supply Co., 1230 So. Tryon, Charlotte
**NORTH DAKOTA**—Dakota Electric Supply Co., 1017-1023 Fourth Ave. N., Fargo
**OHIO**—Burdett Oxygen Co., 3300 Lakeside Ave., Cleveland; Menna Welding Co., 1102 W. Central Ave., Toledo
**OKLAHOMA**—Welders Supply Co., 422 So. Walker, Oklahoma City
**OREGON**—J. E. Haseltine Co., 115 S.W. Second Ave., Portland (also WASH.)
**PENNSYLVANIA**—Arcway Equipment Co., 49th & Grays Ave., Phila. (also N. J.)
**SOUTH CAROLINA**—Cameron & Barkley Co., 84 Sheppard, Charleston
**TENNESSEE**—Welding Gas Products Co., 821 E. 11th, Chattanooga; Delta Oxygen Co., 786 Madison Ave., Memphis
**TEXAS**—J. Ernest Stroud & Co., 501 E. 3rd Ave., Amarillo;—Briggs-Weaver Machinery Co., 309 No. Market, Dallas;—Texas Welding Supply Co., 1302 McKinney, Dallas;—Car Parts Depot, Inc., 712 Texas, El Paso;—Fort Worth Welding & Supply Co., 2228 No. Main, Fort Worth;—G.E. Houston Welding Division, 5931 Clinton Dr., Houston;—San Antonio Machine & Supply Co., 325 No. Centre, San Antonio
**UTAH**—The Galigher Co., 48 So. Second E., Salt Lake City
**WEST VIRGINIA**—Bluefield Supply Co., Bluefield; Logan Hardware, Logan; Virginian Electric, Inc., Box 2833, Charleston
**HAWAII**—W. A. Ramsay, Ltd., Box 1721, Honolulu, T.H.
**CANADA**—The Canadian General Electric Co., Toronto
**OTHER FOREIGN COUNTRIES**—The International General Electric Co.

## ALL of the WELDING PERFORMANCE ... NONE of the "Dead-weight"!

1. Snappy, stable arc, higher efficiency, and superior welding performance over a broad current range
2. 50% savings in size and weight
3. Single-dial dual current control and handy electrode selector
4. Dependable, low-cost service over a long "life span"
5. Easy, inexpensive maintenance

### MAIL TO YOUR G-E ARC-WELDING DISTRIBUTOR TODAY

Send me a copy of bulletin GEA-4852, describing in detail the new WD-40 series of d-c welders—including disassembled views, dimensions, and specifications.

Name .....

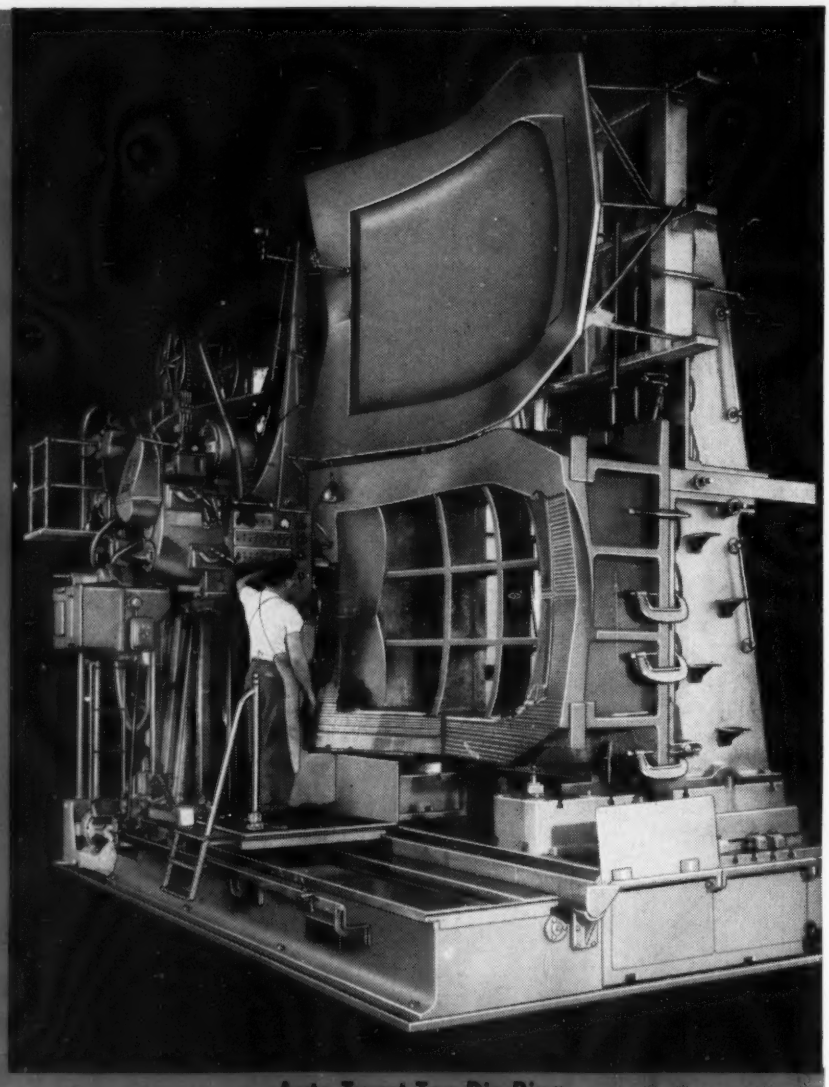
Company .....

Address .....

City ..... State .....

672-87

# BIG DIES



Auto Turret Top Die Ring

## DIEMAKERS SINCE 1906 TOOLMAKERS

## *specialists*

**AUTOMOBILE, TRUCK and TRACTOR front ends, doors, hoods, fenders, body panels, pans, etc.**

**REFRIGERATOR doors, aprons, outer shells, inner liners—RANGE tops—similar appliance parts.**

**AND OTHER MAJOR STAMPINGS**

***Wire, phone or write for Contract Service Engineer to consult with you in your plant—no obligation.***

**the *Sheffield* corporation**

***Dayton 1, Ohio*** **U.S.A.**

Sheffield MASTER CRAFTSMEN

2581

***Sheffield's principal products include***

GAGES
MEASURING INSTRUMENTS
MACHINE TOOLS
THREADING TOOLS
CONTRACT SERVICES

•

*Standard Gages shipped within 24 hours*

## EDITORIAL STAFF

E. L. SHANER
*Editor-in-Chief*

IRWIN H. SUCH
*Editor*

WM. M. ROONEY
*News and Markets Editor*

J. D. KNOX
*Steel Plant Editor*

GUY HUBBARD
*Machine Tool Editor*

DON S. CADOT
*Art Editor*

ALLEN G. GRAY
*Consulting Editor*

### ASSOCIATE EDITORS

W. J. CAMPBELL • F. R. BRIGGS
JAY DEEULIS • VANCE BELL
WALTER F. TOERGE

### ASSISTANT EDITORS

H. C. TUTTLE • DOLORES K. BLAHA
HENRY J. HOLTZ • L. J. SKUDERIN
JOHN S. MORGAN • M. T. BORGERHOFF

### RESIDENT EDITORS

E. C. KREUTZBERG
*Washington Editor*

B. K. PRICE
*Eastern Editor, New York*

L. E. BROWNE
*Associate Editor, New York*

E. F. ROSS
*Chicago Editor*

J. C. SULLIVAN
*Pittsburgh Editor*

A. H. ALLEN
*Detroit Editor*

VINCENT DELPORT
*European Editor, London*

### EDITORIAL CORRESPONDENTS

R. W. KINCEY, *Birmingham*
L. C. FELDMANN, *Buffalo*
SAMUEL S. CARR, *Cincinnati*
MAC HUTCHENS, *St. Louis*
GEORGE R. REISS, *Youngstown*
MAURICE BEAM, *Los Angeles*
ROBERT BOTTORFF, *San Francisco*
R. C. HILL, *Seattle*
C. K. CATES, *Dallas*
F. S. TOBIN, *Toronto*
J. A. HORTON, *Birmingham, Eng.*
LEON JAUDOIN, *Paris, France*
JACQUES FOULON, *Liege, Belgium*

### MAIN OFFICE

Penton Building, Cleveland 13, Ohio

### BRANCH OFFICES

*New York* 17 .....16 East 43rd St.
*Chicago* 11 .....520 North Michigan Ave.
*Pittsburgh* 19 .....2806 Koppers Bldg.
*Detroit* 2 .....6560 Cass Ave.
*Washington* 4 .....956 National Press Bldg.
*Los Angeles* 4 ....130 N. New Hampshire Ave.
*London* ....2 Caxton St., Westminster, S.W. 1


*Business Staff on Page 4*

**NEXT WEEK . . .**

**Radiography Shows Casting Defects**

**Modern Metal Protection Symposium**

**"Harnessed" Air in Industry**

**All-Basic Open Hearth Procedures**

**Abstracts of Metal Show Papers**


# STEEL

*The Magazine of Metalworking and Metalproducing*

Vol. 121, NO. 17 OCTOBER 27, 1947


## NEWS


★ As the Editor Views the News ..... 41
Metals Show Emphasizes Productivity ..... 45
Productivity Is Emphasized at Wire Convention ..... 47
★ Present, Past and Pending ..... 47
Gray Market Forms Own Channels ..... 48
Rolling Mills Recently Completed or Under Construction ..... 49
Slow Rise in Prices Noted on Machinery Items ..... 50
Airplane Industry Ranks High on West Coast ..... 51
★ Calendar of Meetings ..... 51
Steel Most Critical Problem in European Aid Program ..... 52
Government Cites Identical Bids in Cement Case ..... 53
★ Windows of Washington ..... 54
Balanced Budget Is Aim of New French Decrees ..... 57
Labor Cited as Cause of India's Falling Output ..... 57
Germans Fear Growth of New Steel Monopoly ..... 58
Introduces New Light Weight Car Draft Gear ..... 59
Leece-Neville Co. Starts Volume Production Line ..... 59
★ Mirrors of Motordom ..... 61
Ever-Changing Products Mark Mullins History ..... 64
★ Briefs ..... 65
★ The Business Trend ..... 66
★ Men of Industry ..... 68
★ Obituaries ..... 73
★ Construction and Enterprise ..... 148


## TECHNICAL


Lubrication of Grinding Machinery ..... 74
Lighter Making Involves Many Metalworking Procedures ..... 77
Interrupted Quenching as a Metallurgical Tool ..... 79
Mechanized Welding and Cutting in Fabricating Earth Movers ..... 80
★ Engineering News at a Glance ..... 86
Small Diameter Work Rolls Feature Montgomery Cold Strip Mill ..... 88
Bend Testing of Armature Binding Wire ..... 92
★ Progress in Steelmaking—Oxygen Generation Developments ..... 98
★ New Products and Equipment ..... 117
★ Helpful Literature ..... 123


## MARKETS


Rising Costs Threaten To Force Steel Prices Upward ..... 125
★ Market Prices and Composites ..... 126
WAA Metal Stocks Valued at $98.5 Million ..... 130

★ *Index to Advertisers* ..... 156


★—Denotes regular features.

# It's Gotta Fit...

DEPENDABLE DAN
*Our Customers' Man*

TURN IN MORE SCRAP — HELP TURN OUT MORE STEEL

## IT MUST FIT YOUR JOB

RELIANCE

## JOB-FITTED STEEL

Best fitted to do a specific job for a specific customer at a specific time — and all factors considered, at lowest cost.

# RELIANCE STEEL DIVISION

*Detroit Steel Corporation*

GENERAL OFFICES: 1025 SOUTH OAKWOOD AVE., DETROIT 9, MICH.

PLANTS: CHICAGO*, CLEVELAND*, DETROIT*, LYNDHURST, N. J., WORCESTER, MASS.

SALES OFFICES: GRAND RAPIDS,* INDIANAPOLIS*, NEW HAVEN, PHILADELPHIA, ST. LOUIS,* TOLEDO*

*ALUMINUM SHEETS and STRIP—available through locations marked*

PRODUCTS
•
SHEETS
Hot Rolled
Hot Rolled Pickled
Cold Rolled
Long Terne
Galvanized
•
PLATES
•
COLD ROLLED STRIP STEEL
Coils and Cut Lengths, Slit or Round Edge
All Tempers
•
ALUMINUM*
Sheets and Strip

October 27, 1947

# Co-ordinating Research

Two events which occurred in Chicago last week help to explain why this nation is strong industrially. One was the seminar on "Fundamental Relations in Fracturing Metals," held in connection with the 29th annual National Metal Congress & Exposition. The other was the dedication of a new manufacturing research department by International Harvester Co.

The seminar, sponsored by the American Society for Metals and co-ordinated by Case Institute of Technology, consisted of six panel discussion meetings at which more than a score of the outstanding leaders in the important field of investigation of failure of metals participated. To the 250 interested persons attending these meetings it was apparent that an amazing volume of research work on why metals fail is being carried on, that there is a great need for codifying and co-ordinating this effort, and that this initial seminar illustrates the type of dragnet discussion which will help to emphasize this need. The seminar must be considered a highly successful first step in pointing the way to clearer over-all objectives in the study of metal fractures.

The new research department of International Harvester is significant in that it constitutes one of the first full-fledged attempts to segregate manufacturing research from other research and manufacturing activities and to concentrate in a single department the responsibility for developing improved manufacturing techniques. Specific objectives of the department are: (1) Investigation of company manufacturing methods and problems, (2) development of manufacturing standards and (3) keeping abreast of all developments in the manufacturing world.

At first glance, one may think that the objectives of the seminar on metal fractures and the new manufacturing research organization are as far apart as the poles. In reality, however, their objectives are quite similar in at least one fundamental respect. In both instances the sponsors are striving to gather the most advanced information on progress in their respective fields from all available sources, to correlate and appraise this information and to utilize the best of it as effectively as possible.

In essence, this is simply a process of organizing research to make it more practical. What the seminar and Harvester's new department are doing in this direction can be done in other fields to good advantage.

* * *

**CONFUSION IN EUROPE:** When the war ended the principal victor nations agreed rather readily upon plans for reducing the level of industry in Germany, Austria and Japan to a point which was calculated to permit the defeated countries to rehabilitate for peaceful pursuits but would prevent them from rebuilding a war potential.

This involved the destruction or removal of certain plants for reparations. Delays in designating plants for reparations and other uncertainties have kept some production facilities in defeated countries in a state of idleness pending decisions.

This idleness has contributed to the inability of Germany, Austria and Japan to resume production on a satisfactory basis. While the level of industry for Germany was raised considerably early this year, that nation's productive facilities still are in a tangled mess. In view of the new angles injected into European rehabilitation by the Marshall Plan, it would seem to be in order to review the top policy regarding German industry to co-ordinate plant de-

(OVER)

# AS THE EDITOR VIEWS THE NEWS

struction and removals with whatever aid will be forthcoming under the Marshall proposal.

To continue to destroy or remove existing facilities and then to replace them in part later with the help of equipment or money provided under the Marshall Plan does not make sense, yet there is danger that this is exactly what may happen. —pp. 52, 58

* * *

**CONTROLS NOT NEEDED:** In some quarters every new difficulty in regard to supplies or prices is frantically seized upon as a powerful argument for reinstituting government controls. The hue and cry has caused some steel consumers to fear the possibility that the intensification of the present domestic steel shortage by the additional steel requirements of the Marshall Aid-To-Europe Plan may lead to the revival of government steel allocation controls.

Current Washington opinion is that these fears are groundless. It is stated on good authority that the prospects of another era of steel allocation under any conditions that now can be foreseen "are so remote as to be negligible."

Most industrial executives will hope that nothing will occur to alter this present resolve to avoid controls. One control added now inevitably would lead to others until in the end we would be following the unhappy path of Britain. —p. 52

* * *

**LEGAL GREEN LIGHT:** A bill tentatively entitled "Trade Practice Conference Act of 1947" now is being polished for possible submission to Congress in January. If passed it would go far in clearing up uncertainties as to whether proposed business actions would be illegal under antitrust laws.

The bill would authorize government officials, through adoption of a trade practice rule for an industry, to advise business men in advance of a court test that a given action was not, in their opinion, violative of these laws. Also it would give businessmen immunity from prosecution for any act or omission to act resulting from conformity to such a rule.

Enactment of this bill would safeguard business some of the shabby "double-crossing" that has occurred frequently in the past. Similar attempts to advise business what it can or cannot do have been made before without success. This bill deserves a better fate. —p. 54

**SIGNS OF THE TIMES:** Allegheny Ludlum Steel Corp., in a survey on the use of stainless steel—particularly 18-8 chromium-nickel types—in the dairy industry, finds that whereas in 1930 thirty per cent of all new milk processing equipment was made of stainless steels (p. 86), by 1941 this percentage had risen to 66.7 per cent. It is estimated that in the immediate postwar period over 80 per cent of all new equipment coming in contact with milk in dairy plants will be of stainless steel. . . . Home building construction is exceeding predictions made early this year. Private builders started work on 88,000 new permanent homes in September (p. 54), a new peak month with the possible exception of a month in the spring of 1925. A noticeable aspect of the house building spree is the lag in construction of prefabricated steel houses under the government's guaranteed market plan. . . . A. O. Smith Corp. is manufacturing a new railroad freight car draft gear (p. 59) which is made entirely by fabricating and welding rolled steel and weighs only 202 pounds. . . . Although West Coast airplane production has contracted markedly since the wartime peak, western airframe and parts plants now employ approximately 100,000 persons (p. 51) and constitute the largest single industry group in a number of cities on the coast. . . . Manufacture of a comparatively simple cigarette lighter in an eastern New York plant involves 156 operations (p. 77), including drawing, welding, soldering, heat treating and many other metalworking procedures. . . . Labor manpower of France has been augmented by 85,000 former German prisoners of war. The program is meeting with more success than was anticipated (p. 57) and today about 20 per cent of p.o.w. in France are working as free laborers. . . . Revenue freight car loadings totaled 956,862 in the week ended Oct. 11. This is the second consecutive week (p. 66) in which car loadings have been the highest for any week in more than 17 years. . . . Of 57 rolling mills under construction several months ago, 11 are in operation (p. 49), 26 will be completed by the end of 1947, six will be completed early in 1948, seven in middle 1948, four late in 1948, one early in 1949 and completion dates for two are not determined.

E. L. Shaner

EDITOR-IN-CHIEF

# It takes *GOOD MEN* to make *GOOD STEEL*

Raw materials, plant facilities, production methods . . . yes, all are essential in the making of quality steel.

But most important of all is *men*—good men. Inland's steelmen are among the country's finest. They are men who have spent their lives in steelmaking . . . men who set their standards high and drive themselves and others to meet these standards . . . men who take personal pride in the steel they produce. Such are the men who make your Inland steel—the steel you can depend upon.

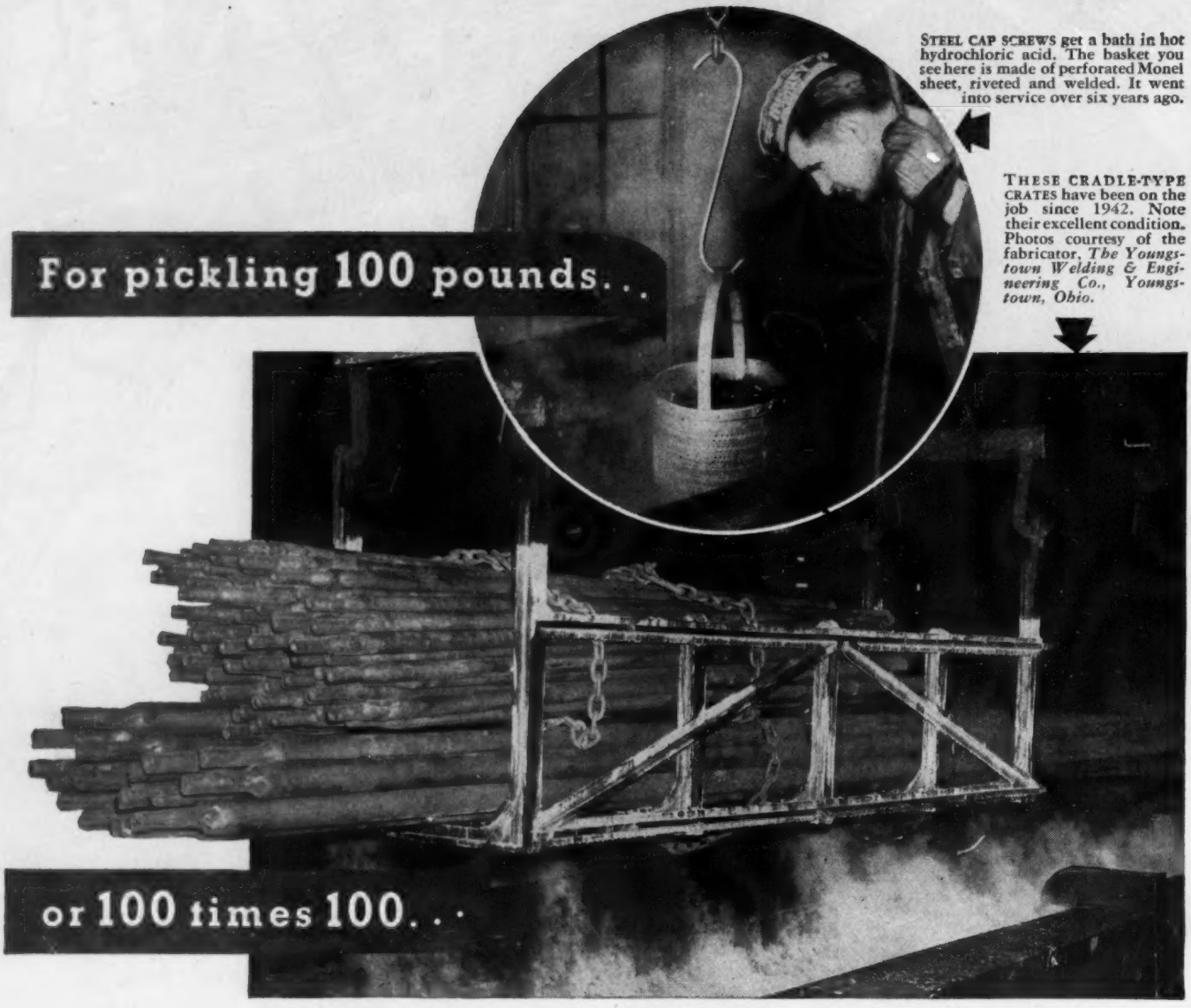
INLAND STEEL

**INLAND STEEL COMPANY**

38 South Dearborn Street, Chicago 3, Illinois

Sales Offices: Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul

BARS • STRUCTURALS • PLATES • SHEETS • STRIP • TIN PLATE • FLOOR PLATE
PILING • REINFORCING BARS • RAILS • TRACK ACCESSORIES




STEEL CAP SCREWS get a bath in hot hydrochloric acid. The basket you see here is made of perforated Monel sheet, riveted and welded. It went into service over six years ago.

THESE CRADLE-TYPE CRATES have been on the job since 1942. Note their excellent condition. Photos courtesy of the fabricator, *The Youngstown Welding & Engineering Co., Youngstown, Ohio.*

# GET THE EXTRA FEATURES OF MONEL

***There's no need*** to pile on ***dead*** weight when you want stronger, longer-lasting baskets or crates.

*Just use Monel*.* It has plenty of *extra* strength and toughness. It resists corrosion by sulfuric acid and dilute hydrochloric acid pickling solutions.

With Monel, your equipment doesn't have to be made extra heavy to allow for rapid corrosion. You handle bigger pay loads faster . . . and with *safety.* You save time . . . labor . . . power . . . acid.

You save another way, too. *Even equipment that must be designed for a special job* can be readily fabricated from regular Monel mill forms (rods, bars, angles, etc.) Whatever its form, Monel is readily cut, bent, machined, forged and welded by ordinary methods. Welding doesn't reduce strength, toughness or corrosion resistance.

Remember all these advantages of Monel when a pickling problem has you stumped. Remember also, that experienced fabricators like THE YOUNGSTOWN WELDING & ENGINEERING COMPANY (who made the basket and rack shown above) can offer practical help in design and fabrication.

**THE INTERNATIONAL NICKEL COMPANY, INC.** *67 Wall Street, New York 5, N. Y.*

EMBLEM OF SERVICE

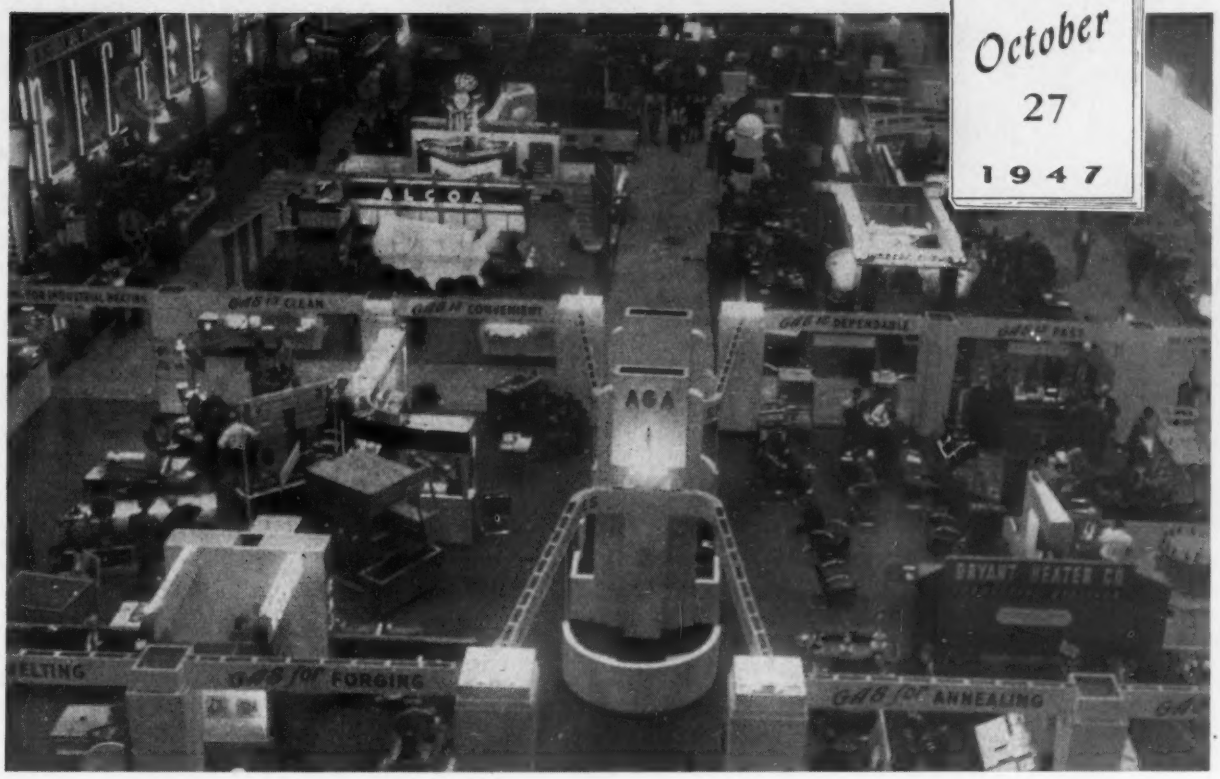
**NICKEL (INCO TRADE MARK) ALLOYS**

**MONEL***

MONEL* • "K"* MONEL • "S"* MONEL • "R"* MONEL • "KR"* MONEL • INCONEL* • NICKEL • "L"* NICKEL • "Z"* NICKEL

*Reg. U. S. Pat. Off.

STEEL
October
27
1947




*Two floors of the International Amphitheatre in Chicago were filled last week with the displays of nearly 400 National Metal Exposition exhibitors. Shown here is the central arena*

# Metals Show Emphasizes Productivity

*Exhibits at National Metal Exposition held in conjunction with National Metal Congress in Chicago stress new era for labor and management through raised manufacturing standards. Further progress in fundamentals emphasized in papers presented at technical sessions of participating societies*

*CHICAGO*

LABOR and management seem to be on the brink of a new era of productivity if the exhibits last week at the National Metal Exposition may be used as trend indicators.

On the labor side, these "industrial indicators" — newly perfected electronic, air and hydraulic controls and ingenious adaptation of these controls—emphasize that operators and other workers are gradually, but definitely, being placed in the position of "foremen of mechanical labor." Instead of spending his time in physical exertion, the worker, more and more, is taking the role of chief observer or inspector of industrial operations rather than performing these activities himself. On the management side, the same developments promise greater profits through raised standards of manufacturing procedure — uniformity of product through quality control and greater output through production short-cuts and elimination of production errors.

**Progress in Fundamentals**—Yet in spite of these developments, metallurgists, engineers and production men, among the some 25,000 to 30,000 visitors attending both the technical sessions in the downtown hotels and the show at the International Amphitheatre, never lost sight of the fact that the key to further progress lies in further exploration of fundamentals.

This was brought home in many of the papers presented in the meetings of the American Society for Metals, American Welding Society, the Iron and Steel and the Institute of Metals Divisions of the American Institute of Mining and Metallurgical Engineers and the American Industrial Radium and X-Ray Society.

At one session sponsored by ASM and co-ordinated by Case Institute of Technology, Cleveland, some 18 papers or discussions on various phases of fundamental relations in the fracturing of metals were presented by experts in metallurgy and metals technology. Dr. George Sachs of Case pointed out that 150 years of research have not yielded much of practical significance to knowledge on the fracturing of metals. Research on the subject, he said, must be of a fundamental character; for that reason amount of work undertaken is not very large compared with that devoted in solving practical problems involving uses of metals.

**Honors To Kinzel**—Double honors, during the congress, went to Dr. A. B. Kinzel, vice president, Electro Metallurgical Co., New York. Besides presenting on Wednesday the Edward DeMille Campbell lecture before the annual meeting of ASM, he was awarded the Samuel Wylie Miller Memorial medal at the American Welding Society's banquet the next day.

## SHOW HIGHLIGHTS

To determine the newest development at the show would actually re-

*Cincinnati Milling Machine Co.'s new flame hardening machine attracted many visitors. It was developed during the war to handle a difficult heat treating job*

quire the services of one of the latest electronic computers as a referee, since at least 50 mechanical methods or machines were shown for the first time. These were some of the highlights:

Lindberg Engineering Co., Chicago, for example, exhibited an entirely new chain production method in which aluminum chain is cast continuously in one piece. Aluminum is fed in one end of the equipment then, following its long journey through special furnaces and dies, the complete chain emerges from the final chamber of the machine.

**Automatic Flame Hardening**—Going outside of its original field, Cincinnati Milling Machine Co., Cincinnati, large machine tool producer, has successfully researched and perfected an automatic flame hardening machine. The machine at the show, just purchased by the Springfield Mfg. Co., Springfield, O., was set up to harden 250 automobile starter ring gears per hour.

Process of homogeneous carburizing which now enables manufacturers to use low carbon steels for pressed and shaped parts was revealed by Surface Combustion Corp., Toledo, O. After parts are fabricated, the process enables a user to place in the material the correct amount of carbon, uniformly diffusing it throughout its entire thickness. Parts of varying thickness resulting from fabrication of strip can be processed as easily as those of uniform thickness.

**"Sewing" Metals** — Another machine which attracted almost as many visitors as the maroon Tucker auto on display, stitched metal to metal, using wire as "thread." Shown by Acme Steel Co., Chicago, the machine "sewed" the metal at speeds up to 280 stitches per minute.

A new salt bath carburizer demonstrated by E. F. Houghton & Co. is completely soluble in hot water, thus making it possible to easily remove encrusted salt from case-hardened pieces.

A new photo copy paper developed by Eastman permits rapid and clear reproduction of engineering drawings.

A new reverse flow, recirculating furnace shown by Stewart provides closer temperature control and more uniform heating throughout the work.

Honan-Crane showed a new mobile filter for soluble oils and cutting oils.

**New Welders** — Westinghouse displayed a new line of AC welders ranging from 200 to 500 ampere capacity and selling in the $300 to $540 price range.

Hammond Machinery introduced a new chip breaker.

Diamond Machine Tool Co. showed a new 55-ton punch press and plans to make models rated as high as 200 tons. The press is designed to specifications of electric strain gage analysis.

Bristol Co. is redesigning and restyling its line of instruments.

A new cemented carbide developed by Kennametal withstands high temperatures which destroy conventional carbide compositions and cast alloys.

**Check for Annealing** — General Electric featured a new DC heavy duty arc welder which operates at 3500 rpm in ratings of 200, 300 and 400 amperes. A new GE metals comparator can differentiate between annealed and unannealed steel bars as well as sort alloys of varying compositions.

An automatic die casting machine shown by Wickes Bros. has a capacity of 25 lb of zinc or 7 lb of aluminum.

Ajax Electrothermic showed a new 20 kw spark gap type converter.

Carboloy "E" lamination die on display ran 12,000,000 strokes without showing sufficient wear to require regrinding.

A new Tocco 7½ kw, 3 megacycle induction heating machine is designed for continuous annealing of wire.

## ASM SESSIONS

Strict limitation on the number of papers presented this year during the American Society for Metals activities produced two commendable results: It enabled visitors to hear all of the papers in which they were interested and boosted attendance at each of the technical sessions considerably.

**Discuss Heat Treating**—Heat treating accounted for a large portion of the subject matter of the sessions, ranging from theoretical studies of phase transformation to practical applications of induction hardening. Other subjects covered in the 30 papers included light metal alloys, recrystallization as a measurement of relative shot peening intensities, alloying elements in white cast iron, grinding hardened steel parts and a bend test for high speed steel. (See STEEL, Oct. 6 issue, p. 110, for more details.)

**ASM Officers**—Francis B. Foley, superintendent of research, Midvale Co., Nicetown, Philadelphia, is the newly elected president of ASM, succeeding A. L. Boegehold, head of metallurgy, Research Laboratory Division, General Motors Corp., Detroit. Other officers are: H. K. Work, manager of research and development, Jones & Laughlin Steel Corp., Pittsburgh, vice president; E. L. Spanagel, engineering and industrial department, Rochester Gas & Electric Corp., Rochester, N. Y., treasurer; W. H. Eisenman, Cleveland, secretary.

Trustees for the year are: A. L. Boegehold; C. M. Carmichael, vice president and director, Shawinigan Chemicals Ltd., Montreal, Canada; John E. Dorn, associate professor of physical metallurgy, University of California, Berkeley, Calif.; A. E.

*(Please turn to Page 146)*

# Productivity Is Emphasized At Wire Convention

*Delegates to annual meeting of Wire Association told of rising wage costs and need for increased worker output*

*CHICAGO*

INTERNATIONAL tone, more dominant than in any previous year, prevailed throughout the 18th annual convention of the Wire Association at the La Salle Hotel Oct. 20-23. Countries the world over are now embarked on rehabilitation and a part of these programs is re-establishment of wire producing facilities.

Among the 400 attending the 4-day convention was a sizable representation from Canada.

**Four Technical Sessions**—Convention program featured four technical sessions, the annual business meeting, a luncheon meeting, the annual dinner and smoker, award of the Wire Association Medal, presentation of the Mordica Memorial Lecture, and two plant inspection trips.

Calling the convention to order, President R. M. Hussey, superintendent, wire department, Jones & Laughlin Steel Corp., Aliquippa, Pa., commented that prices of wire, like all other products, are on the upgrade, and contributing to this unhappy situation is the fact that costs make prices, and wages make costs. He pointed out that since March, 1941, wire workers have received four wage increases. The chief concern today, Mr. Hussey emphasized, is productivity of workers, in other words, output per man-hour.

Soon to be announced, the speaker continued, is a new job classification schedule, which is premised on the assumption a fair day's pay is given for a fair day's work.

**Hold Symposiums** — Setting the stage for the technical program was a symposium on "Improvements in the Wire Industry in the Last Ten Years" arranged by Ralph B. Roth, vice president, Ludlow-Saylor Wire Co., St. Louis. Main subdivisions were brass-copper and bronze wire, alloy and heat resisting wires, stainless steel wire, and low and high carbon steel wire.

A second symposium presented the "Outlook and Present Trend of the Wire Industry." Among contributors to this were Kenneth B. Lewis, consulting wire mill engineer, Worcester, Mass., and J. L. Schueler, general superintendent, Continental Steel Corp., Kokomo, Ind. Highlights of these discussions were steel shortages and need for increased productivity. It was pointed out that despite handicaps, production of wire in 1947 probably will exceed 1946 output by 15 to 20 per cent.

At the luncheon meeting Oct. 22, the Wire Association Medal for the most meritorious paper on wire manufacture or fabrication contributed by a member of the association was presented to Matthew J. Donachie, consulting engineer, Holyoke, Mass. The award was for the paper, "Some Traits and Characteristics in the Working of Beryllium-Copper Wire," which Mr. Donachie authored in 1945 when he was technical director of production, Beryllium Corp., Reading, Pa.

**Mordica Lecture**—Principal feature of the luncheon meeting was presentation of the Mordica Memorial Lecture by F. Titue Updike, chief engineer, products engineering department, Round & Rolled Wire Division, John A. Roebling's Sons Co., Trenton, N. J. In the lecture, the speaker discussed wire in the automobile industry.

This meeting was concluded with a demonstration of the magnetic wire recorder by J. S. Kemp, engineering advisor, Armour Research Foundation, Illinois Institute of Technology, Chicago.

A most imposing symposium, "World Wide Wire Industry," was presented at the concluding technical session. This symposium, painstakingly arranged by Dr. F. R. Morral, metallurgist, American Cyanamid Co., Stamford, Conn., and chairman of the association's program committee, embraced reports from Austria, Belgium, Canada, Chile, Czechoslovakia, Germany, Great Britain, India, Ireland, Spain, South Africa and Sweden.

The two plant inspections, each occupying an afternoon during the convention, were the wire mill of Republic Steel Corp., Chicago, and Hawthorne Works of Western Electric Co. Inc., Cicero, Ill.

## Present, Past and Pending

### ■ SEPTEMBER TOOL SHIPMENTS INCREASE

CLEVELAND—Machine tool shipments during September totaled $22,520,000, compared with $18,520,000 in August, according to the National Machine Tool Builders' Association. New orders in September were slightly above August but below the monthly average for 1947. Backlog of unfilled orders is equal to nearly 5½ months at the September rate of shipments.

### ■ IHC OPENS NEW RESEARCH DEPARTMENT

CHICAGO—International Harvester Co. has opened a new manufacturing research department, housed in a 230,000-sq ft building at 5225 S. Western Blvd., purchased from the government.

### ■ SEPTEMBER STRUCTURAL STEEL ORDERS DROP

NEW YORK—Fabricated structural steel orders for September totaled 131,702 tons, off slightly from August but equal to the average for the first eight months. Shipments totaled 150,952 tons.

### ■ GREAT LAKES INCREASES EXPANSION PROGRAM

DETROIT—Great Lakes Steel Corp., unit of National Steel, has upped its plans for additional cold-rolling capacity by another 300,000 tons annually. Under present projections, Great Lakes capacity will be increased from 700,000 tons of cold-rolled sheets annually, to 1,500,000 tons some time next year, or approximately 115 per cent increase.

### ■ BUFFALO PLANTS SLOWED BY POWER CUT

BUFFALO—Industrial plants in the Niagara frontier area curtailed production last week in compliance with a request by the Buffalo-Niagara Electric Corp. to reduce power consumption. Action was necessitated by dry weather conditions which have reduced the stream flow in the Adirondacks.

### ■ BURROUGHS LAUNCHES $3 MILLION EXPANSION

DETROIT—Burroughs Adding Machine Co. is launching a $3 million expansion program to meet the company's $96 million backlog and to prepare for new products.

# Gray Market Forms Own Channels

*Premium-priced steel tonnage still large; bulk goes for repeat orders to manufacturers without other sources of supply. Buyers taking initiative by advertising for premium material. Imports lost*

GRAY market transactions in steel are establishing a distribution pattern all of their own.

Although the tonnage of premium-priced material moving apparently is as great as ever, the bulk is now going to repeat customers. Steel users without a source of supply, or with a woefully inadequate one, who have made initial purchases in the gray market naturally return to that market for further supplies.

Consumers who turned down brokers' offerings of high-priced material on the first offers have more or less been dropped from the prospect lists and are less often approached by the gray market operators. The latter are having little difficulty in disposing of all the steel they can get their hands on.

Prices asked for the irregular offerings continue highly erratic. Some buyers say they are as high as ever. Others note some softening. Within the past week, substantial tonnages of hot-rolled sheets, pickled and oiled, 16 gage, were being offered at 11½ cents. Other gray market quotations for sheets, hot and cold-rolled, in various gages, range all the way from 6 to 12½ cents.

**Consumers Advertise**—Many users are so desperately in need of steel, especially flat-rolled products, that they are taking the initiative by advertising for gray market material. Ads are appearing in daily papers for "500 tons, 16 to 24-gage sheets, desperately needed. Will pay exorbitant prices." Or "Wanted, 24-gage sheets. Will pay 10c lb.," etc.

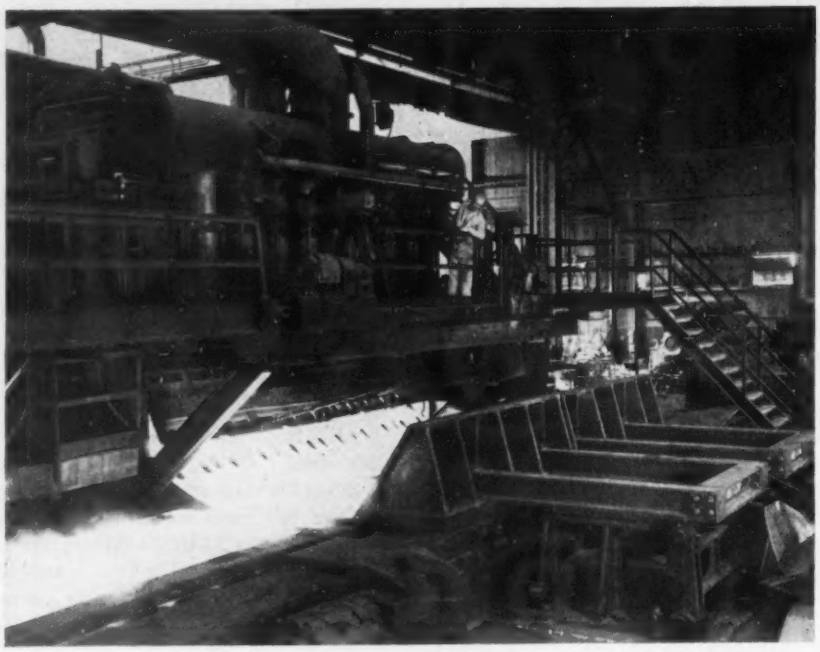
**Where the Difficulty Lies**—Steel hungry consumers fall into fairly well defined classes, about as follows:

1. Established firms which hold a position on mill books based on prewar purchases. Generally these companies are not receiving all the steel they could use.

2. Established companies which had prewar relations with the mills but which are located in remote areas. In some instances, the mills have withdrawn from the areas in which their former customers are located.

3. Established companies which had prewar relations with a mill whose ownership has changed and whose new owners do not recognize the former customers.

4. New companies organized during or after the war, which have no position on any mill books, and companies which were small enough to depend entirely on warehouse supplies before the war.



CAPACITY STEPPED UP: Skidding out of the new No. 4 reheating furnace onto the 80-in. hot strip mill at Irvin Works of Carnegie-Illinois Steel Corp., this 18-ft slab will be rolled into a 2000-ft coil of steel in 2 minutes. The new heating furnace is part of an expansion program which will step up the Irvin Works' hot strip mill capacity by approximately 300,000 tons annually

**Customers Supply Steel** — Manufacturing companies without any mill source of supply, or with an inadequate one, are having a difficult job in remaining in business. In some instances, they are paying the high prices asked by the gray market operators.

One midwestern stamping company is processing 1500 tons of steel a month, although the company does not have a single order on the books of any steel company. Steel is supplied by customers.

**Correction Needed**—Steel users are agreed that the steel supply situation needs correcting badly, but they are somewhat vague as to how such correction can be effected.

The investigation conducted by the Steel Subcommittee of the Senate Small Business Committee was followed with interest by consumers and a number supplied information on irregular steel transactions. Within the past few days the committee received a communication from a long-established eastern warehouse calling attention to an advertised offering of 15,000 tons of mild steel billets to be rolled into shapes and offered for sale at 6½ cents a lb f.o.b. Philadelphia. The warehouse pointed out that mill prices for this material range from 2.9442 to 3.0942 cents and warehouse prices from 4.32 to 4.47 cents a lb. The warehouse suggested the Senate committee investigate the source of the billets and whether or not they were being diverted from legitimate channels.

**New Rolling Capacity To Help** — Bringing into production of the new rolling capacity now under construction (see table opposite) is expected to aid considerably in alleviating the shortage. These mills, with others completed since the war, will raise flat-rolling capacity by about 3 million tons annually, to a total of about 19 million tons. Some industry spokesmen place the present demand for sheet and strip at about 20 million tons currently.

**Imports Lost** — A complicating factor in the steel supply situation,

and one which has received little consideration, is the loss of imports. Before the war substantial quantities of finished steel were imported from Belgium, France, Sweden and Germany. Pig iron came in from British India and the Netherlands. Imports and exports from 1934 to the outbreak of war in gross tons were as follows:

| | Imports | Exports |
|---|---|---|
| 1934 .... | 272,000 | 997,000 |
| 1935 .... | 405,000 | 1,020,000 |
| 1936 .... | 528,000 | 1,233,000 |
| 1937 .... | 452,000 | 3,472,000 |
| 1938 .... | 240,000 | 2,149,000 |
| 1939 .... | 285,669 | 2,499,220 |
| 1940 .... | 58,000 | 8,000,000 |

# Rolling Mills Recently Completed or Under Construction

| Company | Location | Type of Mill | Drive | Probable Completion Date (Estimates as of September) |
|---|---|---|---|---|
| **Continuous Cold Reduction Strip Mills** | | | | |
| Acme Steel | Riverdale, Ill. | 26″ 5-Stand Tandem | W | First quarter 1948 |
| American Rolling Mill | Butler, Pa. | 54″ 5-Stand Tandem | W | Last quarter 1947 |
| *Bethlehem Steel | Lackawanna, N. Y. | 54″ 4-Stand Tandem | W | In operation |
| Bethlehem Steel | Sparrows Pt., Md. | 56″ 4-Stand Tandem | W | In operation |
| *Carnegie Illinois | Gary, Ind. | 42″ 5-Stand Tandem | W | Late 1947 |
| *Carnegie Illinois | Gary, Ind. | 42″ 5-Stand Tandem | W | Early 1948 |
| Crucible Steel | Midland, Pa. | 54″ 3-Stand Tandem | W | Middle 1948 |
| *Great Lakes Steel | Detroit | 54″ 3-Stand Tandem | W | In operation |
| Steel Co. of Canada | Hamilton, Ont. | 54″ 5-Stand Tandem | W | Early 1948 |
| Tennessee Coal, Iron | Fairfield, Ala. | 54″ 4-Stand Tandem | W | 2nd to 3rd quarter 1948 |
| Weirton Steel | Weirton, W. Va. | 42″ 5-Stand Tandem | W | In operation |
| Allegheny Ludlum | W. Leechburg, Pa. | 28″ 4-Stand Tandem | GE | In operation |
| Carnegie Illinois | Gary, Ind. | 54″ 4-Stand Tandem | GE | 2nd quarter 1948 |
| Columbia Steel | Pittsburg, Calif. | 56″ 5-Stand Tandem | GE | 2nd to 3rd quarter 1947 |
| *Columbia Steel | Pittsburg, Calif. | 1—800 hp drive 3-St. Tandem | GE | |
| *Great Lakes Steel | Detroit | 93″ 3-Stand Tandem | GE | Last quarter 1947 |
| *Inland Steel | Indiana Harbor, Ind. | 42″ 5-Stand Tandem | GE | Last quarter 1947 |
| Jones & Laughlin | Aliquippa, Pa. | 42″ 5-Stand Tandem | GE | Last quarter 1947 |
| Granite City | Granite City, Ill. | 56″ 4-Stand Tandem | Allis | 2nd quarter 1947 |
| *Indicates old mills speeded up. | | | | |
| **Reversing Cold Strip Mills** | | | | |
| American Rolling Mill | Butler, Pa. | 40″ Sendzimir Cold Strip | W | Late 1947 |
| Republic Steel | Massillon, O. | 66″ Rev. Cold Strip Mill | W | Late 1947 |
| Republic Steel | Massillon, O. | 54″ Rev. Cold Strip Mill | W | Late 1947 |
| Kaiser Co. | Fontana, Calif. | 24″ Rev. Cold Strip Mill | W | Last Quarter 1947 |
| Crucible Steel | Midland, Pa. | 54″ Rev. Cold Strip Mill | W | Middle 1948 |
| **Hot Strip Mills** | | | | |
| Bethlehem Steel | Sparrows Pt., Md. | 68″ Cont. Hot Strip | Allis | Early 1948 |
| Crucible Steel | Midland, Pa. | Rev. Hot Strip | GE | Early 1948 |
| Geneva Steel | Geneva, Utah | 2-Stand Addition | GE | Early 1948 |
| Inland Steel | East Chicago, Ind. | 76″ Hot Strip—1 Drive | GE | Middle 1947 |
| Republic Steel | Youngstown | 48″ Hot Strip | GE | Middle 1947 |
| Tennessee Coal, Iron | Fairfield, Ala. | 2-Stand Addition | GE | In operation |
| **Skin or Temper Pass Mills** | | | | |
| Bethlehem Steel | Sparrows Pt., Md. | 56″ Temper Mill (Coils) | W | In operation |
| Bethlehem Steel | Sparrows Pt., Md. | 56″ Temper Mill (Sheets) | W | In operation |
| Bethlehem Steel | Sparrows Pt., Md. | 2-Stand Temper Mill | GE | In operation |
| Bethlehem Steel | Sparrows Pt., Md. | 32″ Temper Mill | Allis | Late 1947 |
| Bethlehem Steel | Sparrows Pt., Md. | 2-Stand Temper Mill | GE | Late 1947 |
| Carnegie Illinois | Gary, Ind. | 54″ Temper Mill | W | Middle 1948 |
| Carnegie Illinois | Gary, Ind. | 84″ Temper Mill | W | Late 1948 |
| Columbia Steel | Pittsburg, Calif. | 42″ Temper Mill | Allis | Late 1947 |
| Columbia Steel | Pittsburg, Calif. | 60″ Temper Mill | Allis | Late 1947 |
| Inland Steel | Indiana Harbor, Ind. | 72″ Temper Mill | Allis | Late 1947 |
| Inland Steel | Indiana Harbor, Ind. | 54″ Temper Mill | Allis | Late 1947 |
| Jones & Laughlin | Cleveland | 54″ Temper Mill | W | Late 1947 |
| Weirton Steel | Weirton, W. Va. | 54″ Temper Mill | W | In operation |
| Youngstown Sheet, Tube | Indiana Harbor, Ind. | 42″ Temper Mill | W | Early 1949 |
| **Bar and Rod Mills (Continuous)** | | | | |
| Bethlehem Steel | Lackawanna, N. Y. | 10″ Bar Mill | GE | 2nd quarter 1947 |
| Bethlehem Steel | Los Angeles | 12″ Merchant Bar | Crocker Wheeler | Late 1947 |
| Crucible Steel | Midland, Pa. | 24″ 6-Stand Rod, Billet | GE | Late 1947 |
| Laclede Steel | Alton, Ill. | 10″ Morgan Rod Mill | W | Late 1947 |
| Latrobe Electric | Latrobe, Pa. | Bar Mill | W | In operation |
| National Tube | Lorain, Ohio | 20″ Continuous Billet | Allis | Late 1948 |
| National Tube | Lorain, Ohio | 26″ Continuous Billet | Allis | Late 1948 |
| Sheffield Steel | Kansas City, Mo. | Morgan Rod Mill | GE | Late 1947 |
| **Reversing Blooming, Bar and Billet Mills** | | | | |
| A. M. Byers | Economy, Pa. | 26″ Blooming Mill | GE | |
| Bethlehem Steel | Los Angeles | 32″ Blooming Mill | Allis | Late 1947 |
| National Tube | Lorain, Ohio | 46″ Blooming Mill | W | 2nd quarter 1948 |
| National Tube | Lorain, Ohio | 35″ Bar Mill | Allis | 2nd quarter 1948 |
| Wheeling Steel | Wheeling, W. Va. | 36″ Blooming Mill | W | 3rd quarter 1948 |

# Slow Rise in Prices Noted on Machinery Items

*BLS index for general and auxiliary machinery, equipment gains 1 per cent from May through July*

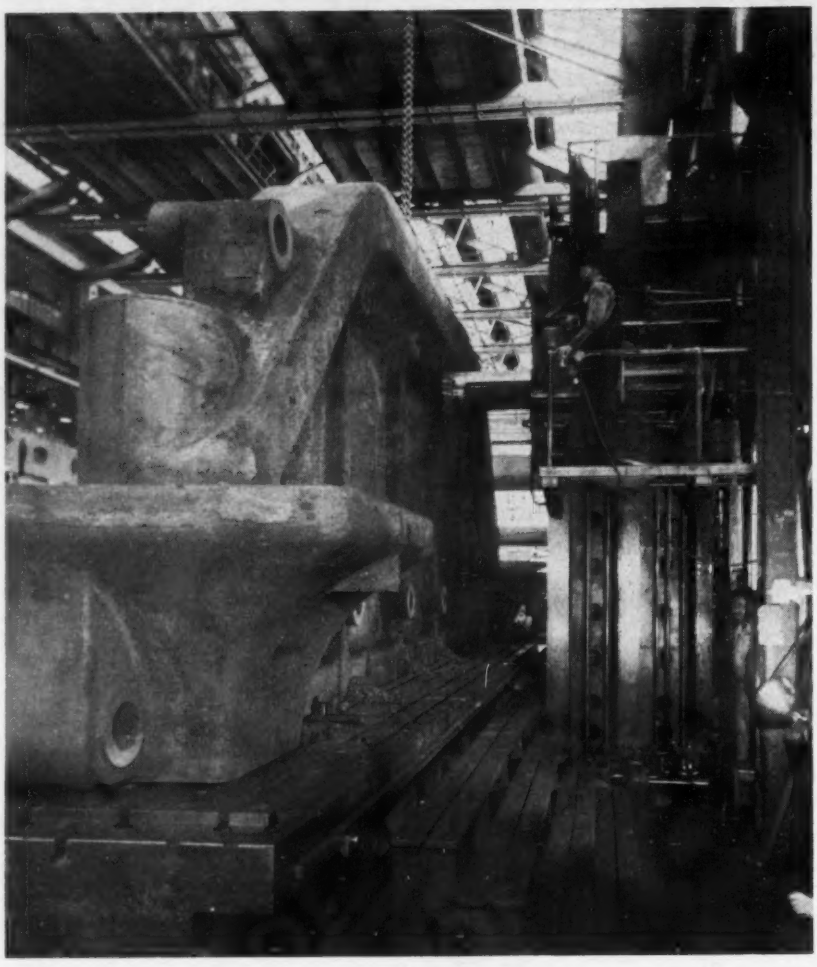
AVERAGE rise in prices on auxiliary machinery and equipment between the beginning of May and the end of July, as reported by the Bureau of Labor Statistics, was 1 per cent, bringing the advance from January of this year to 2.3 per cent.

Since August, 1939, base month for the index, average prices for the products making up the general classification have advanced 27 per cent.

**Trend Is Varied**—Individually, from May through July, the product groups showed varying price tendencies—ranging from stable quotations for air compressors, fans and blowers, industrial oil burners and heat exchangers, water and oil coolers, to a 2.9 per cent increase in powered pumps.

Between these two extremes were mechanical stokers, industrial heat treating furnaces, gas welding and cutting equipment, lubricating equipment, materials handling equipment, mechanical power transmission equipment, industrial scales, cutting tools and machine tool attachments, engines, scientific instruments and mechanical measuring and testing instruments.

**Cutting Tools Steady**—Of general interest to the metalworking industries, most cutting tools and machine tool attachments showed little or no change in price levels between April and July. In fact of the ten products listed in this group, four showed no change in prices since January and one product, wood saw blades, was quoted at slightly lower prices. The tabulation shows the index of cutting tool and attachment prices.



ADDS NEW TOOLS: This massive Ingersoll table type open side mill is among the new items of equipment being installed by E. W. Bliss Co. at Salem, O., in an expansion program. Company is adding $350,000 worth of modern machine tools and is rehabilitating several buildings to yield 33 per cent more floor space. Mill above is 10 x 10 x 30 ft, has two spindles, 14 and 6 in. It is shown boring and facing tie rod holes on a 144,000-lb Bliss press bed

(August, 1939=100)

| | 1946 Average | 1947 Jan. | Apr. | May | June | July* |
|---|---|---|---|---|---|---|
| All Cutting Tools, Tool Attachments | 111.0 | 117.3 | 117.9 | 118.1 | 118.2 | 118.7 |
| Twist Drills | 110.5 | 116.7 | 116.7 | 116.7 | 116.7 | 116.7 |
| Milling Cutters | 112.2 | 119.3 | 119.3 | 119.3 | 119.3 | 119.5 |
| Reamers | 110.1 | 116.5 | 116.5 | 116.5 | 116.5 | 116.5 |
| Hand Taps | 109.4 | 116.7 | 121.5 | 121.5 | 121.5 | 122.3 |
| Dies | 110.0 | 117.2 | 123.1 | 123.1 | 123.1 | 130.5 |
| Grinding Wheels | 111.8 | 118.6 | 118.6 | 118.6 | 118.6 | 118.6 |
| Wood Saw Blades | 111.0 | 115.7 | 115.4 | 115.4 | 115.4 | 115.4 |
| Metal Saw Blades | 107.0 | 112.4 | 112.4 | 114.2 | 116.0 | 118.6 |
| Machine Knives | 111.6 | 116.4 | 122.9 | 125.1 | 125.1 | 125.1 |
| Files | 111.9 | 116.9 | 116.9 | 116.9 | 116.9 | 116.9 |

* Preliminary

## Tool Building Industry's Employment Dropping Off

Employment in the machine tool building industry, although less than half as large as during 1943 when the peak of the industry's war boom had already passed, is still close to 50 per cent greater than it was during prewar 1939, but the trend this year has been steadily downward. Latest figures from the Bureau of Labor Statistics on production workers in the industry place employment in June at 53,400 compared with 55,100 in May and 59,800 in January.

Average hourly earnings in the industry have advanced almost 84 per cent over those paid in 1939, the average hourly rate in June being 138.1 cents, compared to 75.2 cents in that year and 79.7 cents in January, 1941. The June rate exceeds by 2.4 cents the average hourly rate paid in May of this year and by 5.5 cents the rate of last January. Average weekly hours for the industry has changed very little between prewar 1939 and postwar June, 1947. June's work-week of 42.2 hours for the industry is only .7 hours shorter than the average work-week for the machine tool builders in 1939.

# Airplane Production Ranks High Among Industries on West Coast

*Postwar slump in military demands felt but airframe and parts plants in area employ approximately 100,000 and constitute largest single industry group in a number of cities from Washington state to California*

*SAN FRANCISCO*

WEST COAST airplane production, in spite of the reduced military orders, still remains one of the chief manufacturing industries of the Pacific Coast area, the Federal Reserve Bank of San Francisco reports in a special survey of the industry just completed.

It points out that the western airframe and parts plants now employ approximately 100,000 persons and constitute the largest single industry group in a number of cities up and down the coast.

The bank's report, tracing the growth of the industry, points out that in 1938 the industry was made up of only five or six plants employing, altogether, about 14,000 people. But during the war the mushroom growth of the industry brought peak employment up to 300,000 people in more than a dozen large plants and scores of smaller parts factories.

**Contraction Serious**—But, says the report, "the contraction in procurement of military aircraft since the end of the war has created a serious problem for the aircraft industry, a problem which has not been materially eased by the revival of commercial business. The shrinkage in total volume of plane production since the war peak has, of course, been tremendous. During the war the American aircraft industry reached a maximum production rate of around 100,000 planes per year, practically all of military types. Total shipments of airplanes in 1946 to the U. S. armed services was only 1330 planes. The dollar value of industry sales in 1945 was approximately $10 billion and in 1946 about one-tenth of that amount.

"Preliminary estimates indicate a 1947 volume only slightly larger than last year. While some 35,000 planes were shipped in 1946 to other than military customers about 30,000 of these were small two-place planes having an average weight of less than 600 pounds each."

The report points out that shipments of complete aircraft in 1946 had a dollar value of about $360 million. The difference between that amount and total industry sales of $1 billion was accounted for by experimental and development work of a confidential military nature, including research on rockets, guided missiles, etc., and by production of spare parts, conversion of planes, operation of airports and miscellaneous work.

**Capacity Excessive**—The bank then says that "making allowance for these various sources of income for retirement of some war-expanded plants from aircraft production, it is fairly obvious that productive capacity of the industry is far in excess of existing or immediately prospective market demand."

In spite of the sharp reduction in military demand immediately after the war, current demand for military aircraft still constitutes the greater part of the total market, the report says. This is particularly true of the West Coast aircraft industry.

At mid-1947 the order backlog of the six West Coast aircraft producers was approximately $1 billion, of which three-fourths was military. Only one of the six companies has a larger backlog of commercial business than military orders.

## STEEL ALLOYS

**Experimental production of high-grade steel alloys is progressing in northern California. In a pilot plant operated by the U. S. Bureau of Mines at Shasta Dam, attempts are being made to produce steel alloys from California ores by using cheap, abundant power available in the area.**

**The processes being tested will have to be placed on a practical basis to interest commercial steel producers. How soon that time will come Bureau of Mines officials will not estimate but they report a number of successful heats have been run at the pilot plant. Some of the steels produced have been sent to West Coast steel plants for rolling and forging tests.**

**Thus far, processes for production of sponge iron, electrolytic manganese, electrochromium, electro-cobalt and iron-nickel alloys have been developed at Shasta.**

## Calendar of Meetings . . .

**Oct. 27-29, Western Division, American Mining Congress:** Annual convention, El Paso, Tex. Julian D. Conover, 309 Munsey Bldg., Washington, secretary.

**Oct. 31-Nov. 1, Ohio Valley Section, Ohio Section of Open Hearth Committee and Iron and Steel Division of AIME:** Annual fall meeting, Deshler-Wallick Hotel, Columbus, O. Local chairman is R. S. Bower, Andrews Steel Co., Newport, Ky.

**Oct. 30-31, Nov. 1, American Society of Tool Engineers:** Fifteenth semi-annual meeting, Statler Hotel, Boston.

**Oct. 31, Illinois Mining Institute:** 55th annual meeting, Hotel Abraham Lincoln, Springfield, Ill. Secretary-treasurer of the institute is B. E. Schonthal, 28 E. Jackson Blvd., Chicago.

**Nov. 2-5, National Tool & Die Manufacturers Association:** Annual meeting, Benjamin Franklin Hotel, Philadelphia. Executive secretary is George S. Eaton, Union Commerce Bldg., Cleveland.

**Nov. 3-7, National Electrical Manufacturers' Association:** Second international lighting exposition and conference, Stevens Hotel, Chicago. Association headquarters are at 155 E. 44th St., New York.

**Nov. 3-7, American Institute of Electrical Engineers:** Midwest general meeting, Congress Hotel, Chicago. Institute headquarters are at 33 W. 39th St., New York.

**Nov. 5-7, Industrial Management Society:** Eleventh national time and motion study clinic, Sheraton Hotel, Chicago. Society headquarters are in the Midland Bldg., Chicago.

**Nov. 5-7, American Society of Body Engineers:** Second annual technical convention, Rackham Memorial Bldg., Detroit. Society headquarters are at 100 Farnsworth Ave., Detroit.

**Nov. 6-7, Society of Automotive Engineers:** Fuels and lubricants meeting, Mayo Hotel, Tulsa, Okla.

**Nov. 6-7, National Founders Association:** Annual meeting, Waldorf-Astoria, New York. Association executive vice president is L. E. Roark, 120 S. LaSalle St., Chicago.

**Nov. 7-8, Pittsburgh Conference on X-ray and Electron Diffraction:** Fifth annual meeting. General chairman is Harold Klug, Mellon Institute of Industrial Research, 4400 Fifth Ave., Pittsburgh.

**Nov. 10-13, American Institute of Steel Construction:** 25th annual convention, Roney Plaza Hotel, Miami Beach, Fla.

**Nov. 12-13, British Iron & Steel Institute:** Autumn meeting at institute offices, 4 Grosvenor Gardens, London, England.

**Nov. 13-15, Spectroscopy Society and University of Pittsburgh:** Eighth Pittsburgh conference on applied spectroscopy, Mellon Institute Auditorium, Pittsburgh.

**Nov. 18-19, Packaging Institute Inc.:** Ninth annual forum, Hotel Commodore, New York. Institute headquarters are at 342 Madison Ave., New York.

**Dec. 1-5, American Society of Mechanical Engineers:** Annual meeting, Chalfonte-Haddon Hall Hotel, Atlantic City, N. J. Ernest Hartford, 29 W. 39th St., New York, is executive assistant secretary of the society.

**Dec. 1-7, Exposition of Chemical Industries:** 21st Exposition, Grand Central Palace, New York.

**Dec. 8-13, Automotive Service Industries Show:** Navy Pier, Chicago.

# Steel Most Critical Problem in European Reconstruction Program

*Requirements for foreign aid to compete with domestic demand for inadequate supply. Krug says United States can undertake substantial aid program without jeopardizing national security or living standards. Stresses need for conservation*

STEEL will present the "most troublesome problem of all" in foreign aid program now being formulated by the United States. Requirements for steel products for rehabilitation of Europe will compete importantly with domestic demands and threaten "consequent economic repercussions."

Coal, freight cars and other items of industrial equipment, nitrogen fertilizer and wheat are the other leading factors in the aid program in which domestic shortages will be intensified.

Recognizing the strains which the program will place upon the United States economy, Secretary of Interior J. A. Krug in a survey of U. S. resources finds this country is physically capable of undertaking a "considerable program of foreign aid" without jeopardizing the national security or living standard. Krug's findings are contained in a report on "National Resources and Foreign Aid."

**First of Three**—The Krug report is the first of three asked by the President to aid in mapping the foreign aid program. Another is being prepared by the Council of Economic Advisers appraising the economic impact of a foreign aid program in this country, and a third by the Harriman Committee on the character and quantity of our resources that may be wisely and safely devoted to European reconstruction.

On the basis of the three reports, the President intends to recommend to Congress a foreign aid program, taking into consideration the State Department's findings on the needs of European countries and their proposals for self help and mutual aid.

**Conservation Needed** — Secretary Krug emphasizes that the need for the conservation of our raw material resources is greater than ever before. Demands of the aid program "will aggravate in some measure the strains on our economy."

"It is self-evident," says Krug, "that even a country as wealthy in resources as the United States cannot long underwrite the material deficits of other nations without serious impacts upon its economy and its resources. But we know from our war experience that the limits of what our economy can do are exceedingly elastic and that resources are not fixed and immutable but are subject to constant changes in technology and in production and consumption patterns."

**Allocations Unlikely**—Considerable alarm has been evident in recent weeks among steel consumers over the effect the aid program will have on the domestic supply of steel. Rumors have been current that steel allocation controls would be reinstituted. This possibility is considered in Washington as "so remote as to be negligible."

Washington officials point out that the amount of steel to be shipped to Europe has not yet been determined. Top estimates range between 2 million and 4 million tons. The Harriman committee is expected to screen requests for steel and other materials carefully and to confine exports to imperative emergency and rehabilitation requirements.

It is possible that Steel Products Industry Advisory Committee may be revived to aid in providing essential steel for export under the aid program, as it did in the freight car program.

**Will Aggravate Shortage**—Secretary Krug's report emphasizes, however, that aid requirements will intensify the present tightness in steel supply.

Industry and government co-operation will be needed to make raw materials, including scrap, available and otherwise to insure full utilization of existing capacity.

Continued consideration should be given to increasing domestic capacity for future needs in such a manner as to minimize the effect of taking steel from current critical uses.

In the light of the world steel shortage, supplies made available for export should be channeled to the most important uses. Through government-industry co-operation, supplies should be assured for essential needs at home.

**Scrap is Bottleneck** — To increase the current level of exports without reducing domestic consumption will necessitate the breaking of certain domestic bottlenecks, the Krug report says. First among these bottlenecks is the shortage of scrap and pig iron, which are chiefly responsible for a current 6-million ton gap between production and rated capacity of the steel industry. The Krug report suggests government encouragement and assistance be given to promoting the prompt return of industrial scrap to the mills, to the acceleration of scrapping of remaining war surplus materials and the organization of systematic collection of obsolescent scrap.

Another possibility mentioned is the extension of the high pressure and oxygen techniques to increase production of pig iron from existing capacity.

Solution of the scrap and pig iron problems would permit an increase in ingot output to a level closer to rated capacity than at present.

**Increasing Capacity Difficult**—The Krug report suggests that if the current high level of economic activity continues, the present capacity of the iron and steel industry, even if fully utilized, will be inadequate to meet the demands placed upon it. Increasing the capacity of the steel industry by the construction of additional new facilities, however, would not be effective unless raw materials are available in adequate quantities to make such new facilities fully productive. Moreover, such construction would require the use of steel that is critically needed currently both here and abroad.

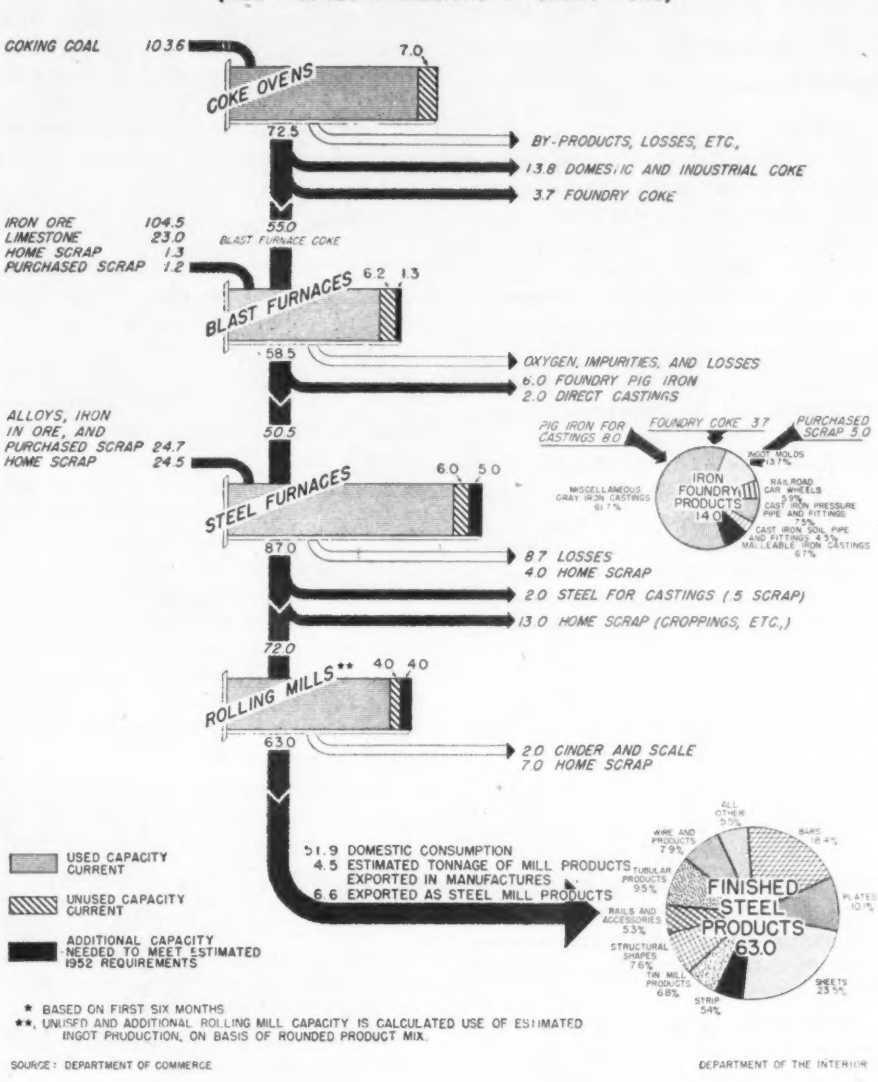
The Krug report estimates current steel production at 85 million tons of ingots annually, yielding 63 million tons of finished steel products. Of this, 51.9 million tons are expected to go into domestic consumption, 6.6 million tons will be exported as steel mill products, and 4.5 million tons will be exported in the form of manufactured goods.

**Industrial Equipment**—To provide for the rehabilitation of the European economy, much industrial equipment will be needed. Many of these items will be readily available for export and others would become quickly available should the steel supply problem be solved.

Particular types of equipment are especially needed abroad which are also in heavy demand at home, and for which productive capacity is limited.

One of the most important of these is freight cars, especially open tops, for the transport of coal. Despite low output of coal in Europe, some is being stored at the mines for lack of inland transport facilities. In this country, the coal car shortage is a major limiting factor in production.

Mining machinery, including rub-




ber conveyor belts, is another serious shortage that limits output of workers in European coal mines and in the phosphate and potash mines of North Africa and Europe.

The Krug report suggests that types of machinery which will best help the Europeans help themselves should be sent quickly to the needy lands. Mining machinery that would help increase Europe's coal output thus would reduce the need for coal exports later.

**Nonferrous Metals** — Inasmuch as the United States is self sufficient in few of the nonferrous metals, the Krug report suggests that future shipments of foreign minerals to this country in partial repayment for the aid extended in the foreign rehabilitation program should be considered.

**Coal**—European production of coal currently is about 25 per cent below prewar rates and western Europe needs approximately 100 million tons annually in excess of its output.

Here the foreign aid program is designed to achieve reconstruction to make Europe self sufficient. If mining machinery and equipment can be supplied and transportation rehabilitated, the coal crisis in Europe should be short-lived.

For this country the problem of producing enough coal to supply Europe's needs without seriously endangering the domestic supply is primarily a transportation problem, rather than a resource problem. Coal cars are the current bottleneck and solution of the coal problem must wait solution of the freight car problem.

**Farm Machinery**—Twelve per cent of agricultural implement output currently is going abroad without noticeably affecting domestic farm output. By next year, much larger amounts of farm machinery can be exported, due to rapid increases in American manufacture.

# Identical Bids In Cement Case Cited To Court

*Attack on basing point system of pricing pressed before Supreme Court. Similar action pends against steel industry*

IDENTICAL bids on thousands of government orders for cement were cited by government attorneys before the Supreme Court last week as evidence of an illegal combination to restrain competition in the cement industry.

The Federal Trade Commission charges that 75 cement companies, all members of the Cement Institute, are acting jointly to keep prices up. Action against the companies, with particular reference to the basing point system of pricing, was started in 1921 and renewed in 1937. A cease and desist order issued by the FTC in 1943 was vacated in the U. S. Circuit Court of Appeals last year (STEEL, Sept. 30, 1946, p. 33) and the case was appealed to the Supreme Court.

The cement case is being watched with particular interest by steel producing and consuming companies inasmuch as a somewhat parallel action is pending against the steel industry.

Government attorneys told the court that "phantom freight" advantage enjoyed by some cement mills ranged from 50 to 73 cents a barrel.

## Tool & Die Group Convenes In Philadelphia on Nov. 2-5

Technical and economic discussions will highlight the annual meeting of National Tool & Die Manufacturers Association when it convenes Nov. 2-5 at the Benjamin Franklin Hotel in Philadelphia.

Included among the discussions will be an address by Marshall M. Smith, president of E. W. Bliss Co., who will review the outlook for industrial recovery abroad, based on a recent trip to Europe. Also featured will be a talk on "What the Taft-Hartley Act Means to You" by Eugene B. Schwartz, a Cleveland attorney. William F. Patterson, director of the U. S. Apprentice Training Service, will speak on training of tool makers, and George Elliott, of Elliott-Jemison & Co., will talk on practical accounting for tool shops.

# Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

*Legislative measure aimed at clearing up uncertainties for business under existing antitrust laws now in final polishing stage. Government officials could advise businessmen in advance of court test as to legality of proposed actions*

IF A BILL now in the final polishing stage becomes law, it will do much to afford a means of clearing up uncertainties as to whether proposed business actions would be illegal under the antitrust laws.

It would authorize government officers, through adoption of a trade practice rule for an industry, to advise business men in advance of a court test that a given action was not, in their opinion, violative of these laws. And it would give business men complete immunity from prosecution for any act or omission to act resulting from conformity to such a rule. It would force the government men to give notice in case they change their minds, with immunity continuing for acts done prior to receipt of such notice.

**No Change in Laws**—The bill provides for no changes whatever in the existing antitrust laws. Its sole purpose is to give business men recourse against the taking of risks as to whether such of their policies as are covered by trade practice rules might later bring federal prosecution and payment of heavy damages. It would help to alleviate the existing condition under which all business now is at the mercy of the government, in which any industry or corporation can be hauled up unexpectedly and revealed to the public as a probable antitrust law violator.

The bill, tentatively entitled the "Trade Practice Conference Act of 1947," has high sponsorship. It was drafted by Lowell B. Mason, member of the Federal Trade Commission, and it embodies the administration view as expressed by President Truman in messages to Congress last year and again this year. It has been referred for consideration by the Federal Law Committees of the American Bar Association and the Chicago Bar Association, and should be ready for submission to Congress in January. In large part, the bill is an outgrowth of a resolution of the American Bar Association, adopted during its convention in Cleveland Sept. 25, which reads as follows:

**Approve Consultative Service**—"Resolved that the American Bar Association approves the suggestion that the Justice Department and the Federal Trade Commission provide a consultative service as to proposed action which may involve violation of the antitrust acts, and that a company be exempt from criminal prosecution after it has in good faith gained clearance for a proposed action."

In submitting the bill, Commissioner Mason told the Chicago Bar Association: "When the President appoints a member of the Federal Trade Commission, the business man's court, it seems to me that commissioner ought not to spend all his time figuring out how many business men he can sue so that he can ask Congress to give him more money so next year he can sue a lot more. . . .

"We need some clarity in government regulation of business. At present the commission recognizes trade practice rules as a substitute for trial prosecutions in a very small area of cases, namely, false and misleading advertising." Under the bill, he explained, the trade practice conference program could be broadened to cover all types of business practices involving questions of compliance with the antitrust laws.

**Immunity Restricted**—As stated above, the bill would effect no change whatever in the present laws. Under it, immunity would exist only for acts or omissions to act resulting from conformity with an approved rule. The fact that acts done were not in violation of any rule would not result in immunity if such acts were in a field of business endeavor not covered by a trade practice rule.

### LOBBYISTS PROBED

**What is hailed as an "exhaustive investigation of lobbyists" has been launched by the Department of Justice. Lobbyists registered in accordance with the terms of the Legislative Reorganization Act of 1946 will not be disturbed. Rather, a check will be made to determine which lobbyists failed to register. The investigation, conducted by the Federal Bureau of Investigation, is believed to be an outgrowth of President Truman's recent condemnation of the real estate lobby which he charged with responsibility for the easing of rent control.**

## Building Going Ahead

Despite the high cost of building construction, government statistics reveal home building undertakings are at the highest level in the nation's history. Private builders, according to the Bureau of Labor Statistics, started work on 88,000 new permanent homes in September.

This exceeds the attainment of any previous month on record, except possibly the peak month in the spring of 1925, the biggest housing year in our history. It marks an all-time high for the month of September. Homebuilding for the first nine months of 1947 showed an increase of 89,300 units over the same period in 1946. So far in 1947 615,000 units have been placed under construction.

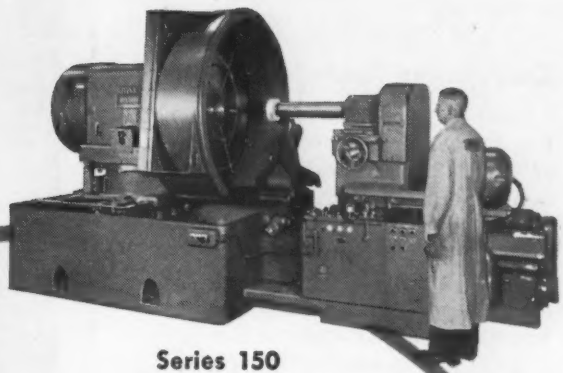
**High Activity**—Figures of the Federal Housing Administration are in keeping and show September starts on 24,073 new dwelling units financed and built under the federal housing program. This compares with 25,167 starts in August. Continued high activity also is indicated by September applications for new FHA construction mortgages on 32,844 dwelling units as compared with 30,957 in August. And a new all-time record was established in September when applications for mortgage insurance on 14,066 one to four-family houses were received.

In one respect the current trend is disappointing and that is in the production of prefabricated steel housing under the government's support plan. Only two prefabricated steel housing interests now are in the guaranteed market plan—Lustron Corp., Chicago, and Metal Homes Co., Los Angeles. Lustron has produced no steel homes to date but is expected to turn out around 100 prior to March 1, 1948. Metal Homes Co. has not produced any to date but is expected to turn out 30 to 40 steel homes prior to Dec. 31, 1947, which, incidentally, is the expiration date for the government's support plan.

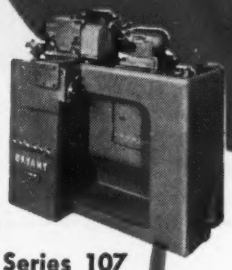
William H. Harman Corp., Philadelphia, which started out under the support plan but now is on its own, has produced about 400 prefabricated steel

# A fine line

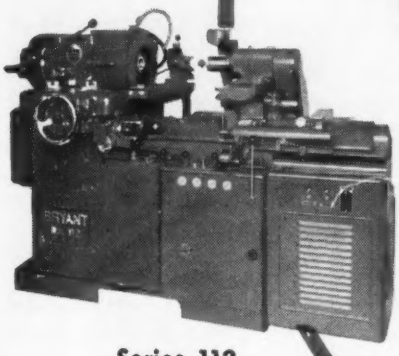
of Internal Grinders for every tool room and production requirement



Series 150



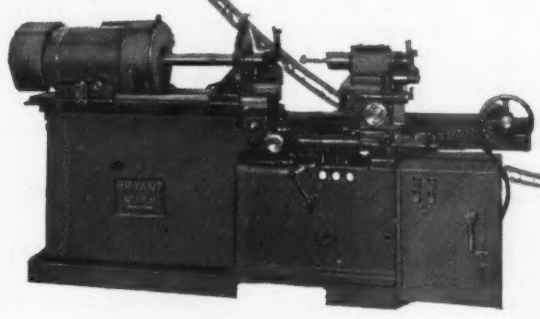
Series 107



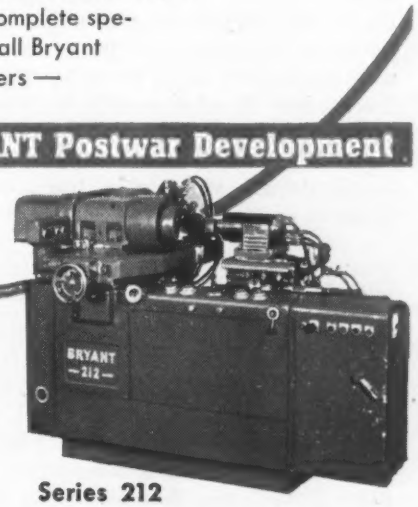
Series 112

**BRYANT** has designed and built precision internal grinders for 38 years. Today, their completely modern line covers the grinding of holes from .040″ to 50″ in diameter. Standard and special machines will grind straight, tapered, curved and irregular holes, or any of these in combination. Face and hole grinding can be combined to assure squareness. Cams and irregular holes can be ground by using the cam attachment. The Series 150 has a face plate 60″ in diameter and will swing work up to 50″. A special machine will take 100″ swing. The Series 107 is equipped with Bryant High Frequency wheelheads giving speeds up to 100,000 R.P.M. for extremely small bores. Maximum swing of the 107 is 9″. Series 112 machines are for general purpose tool room work. They incorporate many quick-changeover features and will swing 16″. The 112-M machines are similar to the 112, but have provision for grinding long bores such as machine tool spindles. Series 212 grinders are completely automatic and will grind bores from 5/16″ to 6″ in diameter. The High Frequency head is used on the 212 for maximum efficiency on small bores. All these machines incorporate the exclusive Bryant feature of hardened and ground cylindrical slide construction and three-point bearing. Complete specifications are available on all Bryant precision internal grinders — write today.

**BRYANT Postwar Development**



Series 112 M




Series 212

Send for the Man from

**BRYANT CHUCKING GRINDER CO.**

SPRINGFIELD, VERMONT, U. S. A.

# BRYANT

houses to date and is expected to turn out around 100 steel homes monthly in 1948.

## Confidences Respected

National Archives officials do not like the inference, discussed in STEEL of July 21, p. 76, that cost information imparted in confidence to the defunct Office of Price Administration possibly might become available to competitors of the reporting companies now that these data have been placed in the archives.

STEEL is informed by Dr. Paul Lewinson, head of the Industrial Records Office at Archives, that individual company reports or records will not be available to anybody not in the employ of Archives. To this rule there is only one exception: The company that reported information may give permission to have it scrutinized by a specifically authorized party.

The only information Archives is willing to give out from the OPA files is an aggregate report for an industry. Such information is given only to parties who are thoroughly investigated and adjudged entitled to receive it for sound reasons of public policy. But there are exceptions: In the case of an industry, for instance, where one company might control, say, 90 per cent of the capacity, and the confidential data of that company approximately revealed by the aggregate figures for its industry, the information is withheld.

With respect to the possibility that "leaks" of confidential information might occur, Dr. Lewinson said 20 people altogether have access to the OPA files, while only 6 of them are familiar with the contents of those files. Under the working system in use at Archives, irregularities in handling material are not easily feasible. Further, says Dr. Lewinson, Archives never in all its history has been victimized by a leak. All in all, he assures, nobody will suffer from the abuse of secrets imparted to the OPA.

## Defend Steel for Pipeline

Allocation of 20,000 tons of steel for start of construction of an 1140-mile pipeline from Saudi Arabia to the Mediterranean Sea (STEEL of Oct. 6, p. 71) is defended by Defense Secretary Forrestal, Acting Secretary of State Lovett and Secretary of Commerce Harriman as "essential in the national interest."

Called before the Senate Small Business Committee at the instance of its chairman, Sen. Kenneth S. Wherry (Rep., Neb.), who criticized the action as unwarranted diversion of steel from domestic consumers, Mr. Forrestal said the Saudi Arabian line "should come ahead of like developments in the United States or the western hemisphere." The pipeline is needed, the administration officials explained, to prevent continued heavy depletion of our petroleum reserves.

Altogether the Saudi Arabian line will require 305,000 tons of steel, final quota to be shipped in the first quarter of 1949.

NEW LABOR OFFICIAL: John T. Kmetz, Nanticoke, Pa., is sworn in as assistant secretary of labor, with Harris P. Shane, center, director of personnel, administering the oath. At right is Secretary Lewis B. Schwellenbach. NEA photo

## Await Stassen's Book

Friends of Ex-Governor Harold E. Stassen feel confident that business men generally will give more ardent support to his Presidential candidacy after they have had an opportunity to read and study his book, "Where I Stand." In it he explains his views on how to obtain sustained prosperity in the private enterprise system. He will tell why in his opinion trends toward socialization of industry must be resisted in the United States, and he will cover many related subjects as to why he is opposed to any reimposition of wage and price controls to fight inflation.

In large part, his book will deal with the foreign policy the United States should pursue in order to fulfill its responsibility of furnishing leadership in the present-day world. For instance, he favors the Marshall Plan for aid-to-Europe, but warns that we must be prepared to furnish aid liberally and over a long period. He also wants our aid administered by an American agency, responsible to Congress and the President, and officered by men of business and productive experience. The book will be on sale at book stores Nov. 10.

## See Rent Control Extended

Lines are being drawn for an indefinite extension of rent control, now, under the Wolcott Act which President Truman signed in June, due to expire Feb. 29, 1948. The President's Council of Economic Advisers has gone on record as favoring "a high degree of stabilization in rents for some time to come." The statement was made on behalf of the council by Leon Keyserling in a letter to Sen. Francis J. Myers (Dem., Pa.), sponsor of a bill to amend the Wolcott Act and extend rent control to Mar. 1, 1949.

## Corporate Net Profits Fall

Corporate profits after taxes were at an annual rate of $16.5 billion in the second quarter, compared with $17.5 billion in the first quarter and $16 billion in the fourth quarter last year, the Department of Commerce has disclosed.

Railroad profits improved moderately during the first half, the survey showed, but were "far below" the war years.

# Balanced Budget Is Aim of New French Decrees

*Qualification for Marshall Plan aid sought. Six million man-days lost in June from strikes. Holidays cut output*

*PARIS, FRANCE*

WITH the economic outlook for France showing no favorable prospects and additional restrictions on the use of electricity, gasoline and even bread now in effect, drastic financial reorganization measures have been ordered by the French cabinet. These actions, aimed at increasing the country's revenue and balancing the 1948 budget, are thought necessary to qualify the country for aid under the Marshall Plan. Other measures are likely to be drafted to suppress all expenditures not vital to the economic life of the nation.

Wage increases and new prices for farm products again raised the cost of living in September. Retail prices based on 34 selected commodities advanced to 1157 from 1068 in August, 965 in July and 730 in August, 1946.

Although labor agitation is not so widespread as it was in the early part of the year, strikes in June, nevertheless, cost the country over 6 million man-days of work. Application of wage scales and food rationing difficulties were largely responsible for the latest demonstrations, but communistic influence also was evident in the unrest. Such a situation in the face of approaching winter is restricting production, already hampered by limited power resources, and industrialists generally agree that increased domestic production, rather than assistance from outside, is the country's main hope.

**War Prisoners Working** — The French labor force has been augmented by some 85,000 former German prisoners of war who have been released conditionally upon their promise to work in France. This program has met with more success than was anticipated last spring when it was inaugurated and now about 20 per cent of France's p.o.w.'s are working as free laborers.

Despite an increased yield per man at the coal face in August, total output showed a decrease of 227,000 tons, or about 6 per cent, the decline being due to holidays. Large imports brought the aggregate coal available to 99 per cent of the 1938 figure, however. Supplies, amounting to 433,000 tons over and above the allocations of the European coal organization, have been delivered by the United States. Ruhr coal, now costing 50 per cent more because of Anglo-American-directed price increases, and requiring dollars in payment, sells for about the same price as American coal, and Polish coal, delivered in France, is even higher.

**Ore Is Plentiful**—Mining of iron ore continues to run about 55 to 58 per cent of the prewar output, with supply in excess of demand. In July 999,100 tons were supplied to blast furnaces against a monthly average in 1938 of 1,447,000 tons.

Iron and steel production in August showed mixed trends—pig iron output slightly higher at 422,000 tons and steel production dropping a little to 451,000 tons. Only 68 furnaces were in operation compared with 81 in 1938. Output of rolled steel in August at 280,000 tons was 10 per cent less than it had been in July because of the fewer number of working days.

### GOING MODERN

**To serve as a pattern for a new fleet of British railway cars, an all-stainless steel custom-built passenger car has been built and shipped to England by the Budd Co., Philadelphia. Pressed Steel Ltd., using Budd manufacturing methods, will use the car as its prototype for revolutionary British railway transportation.**

**Combining traditional British compartments with coach seating comparable with the best offered on American roads, the car will accommodate 18 first class and 30 third class passengers. Reclining, revolving, foam-rubber padded coach seats have individual reading lamps and adjustable foot rests. Separate rest rooms are provided for both classes of travelers.**

**Although the car uses standard British four-wheel trucks and is built to conform to newly established standard cross sections and longer length specifications, traditional wood framing has been replaced by stainless steel structural members, and welded stainless exterior panels lighten the car's weight by about 11,000 lb.**

# Labor Cited as Cause of India's Falling Output

*Tata chairman condemns attitude of labor, says company has been forced to shelve its expansion plans*

*JAMSHEDPUR, INDIA*

LABOR difficulties, disrupting production and giving impetus to an already dangerous inflationary trend in India, were cited recently by J. R. D. Tata, chairman, Tata Iron & Steel Co. Ltd., as the most vital problem now facing Indian industry.

In presenting the annual report of the company to the stockholders, Mr. Tata said attitude of labor has become the biggest factor in the declining trend of Indian production. Other factors, such as the coal and transportation shortages, have largely been overcome and are now overshadowed by labor unrest.

"The first and the most crying need of the country today is for production and more production," he said, "and yet on every hand, we are met with the spectacle of falling production and rising costs." A steep decline in production of industrial goods of all types was depicted in his report. Coal output which averaged 2.1 million tons a month in 1945 is about 1.9 million tons now; electric energy output has fallen from 194 to 177 million units. Finished steel production has fallen from 1,201,000 tons for the best war year to 892,000 tons in 1946.

**Strikes Cut Steel Output**—"In the case of this company," he related, "the output of finished steel has declined from the peak of 839,000 tons in 1941-42 to 753,000 tons in 1946-47. The production for 1947-48 is likely to be still lower . . . Steel is the crying need of the country . . . Practically no steel is available from outside India. It is at this very time that steel production has been reduced by a prolonged strike in the works of the Steel Corp. of Bengal and slow-down tactics in our works."

Expansions which had been started or were contemplated by the company are having to be postponed or abandoned, Mr. Tata declared. Plans to manufacture steel tubes under agreement with the English firm of Stewarts & Lloyds have had be to shelved as have been plans for the manufacture of tool and alloy steels.

# Germans Fear Growth of New Steel Monopoly

*Raw steel producing plants seen as nucleus for trade-union domination. Plan to move Ruhr works assailed*

*DUSSELDORF, GERMANY*

DECONCENTRATION of the German steel industry is still progressing, the latest move in this direction being the formation of two independent steel companies to produce only steel ingots. Nearly 30 independent steel concerns have been established so far, with the aim of the program being to break up the Ruhr steel combines and eliminate the vertical structure of the industry.

The new companies are Huettenwerk Huckingen A. G., renting the modern steel plant and rolling mill of Mannesmann Roehrenwerke at Huckingen, and Huettenwerk Rheinhausen A. G., taking over the Friedrich Alfred steelworks which formerly belonged to the Krupp combine.

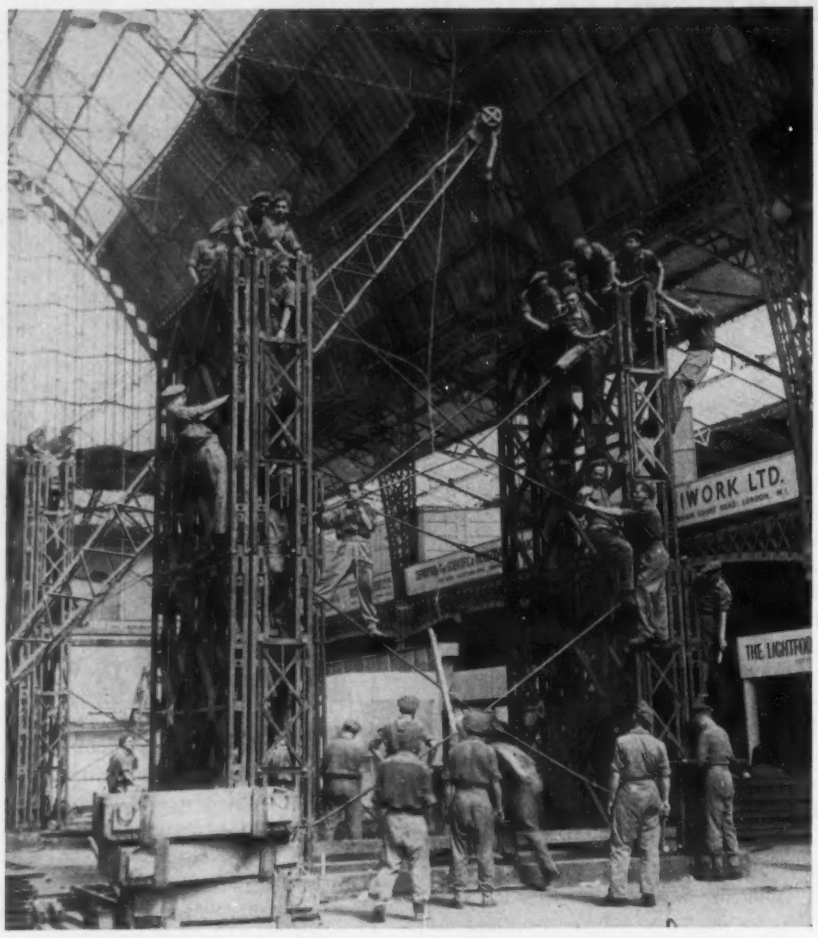
**New Monopoly Seen in Making**—Although the new companies are poorly financed and are heavily subsidized to make up for their operating losses, the original companies from which the plants have been taken are worse off, left with only their finishing capacities. The new firms, taking over assets and paid for on a rental basis, are not assuming the liabilities of the parent organizations, many of which are heavily indebted to foreign countries. The deconcentration scheme appears to be forming the basis for a new monopoly along horizontal lines. Under direction of the custodian office, managed by trade union officials together with technicians, the 30-odd new companies making raw steel may be used as a possible spearhead for a trade-union-fostered nationalization movement.

**French Plan Criticized** — French proposals suggesting an expansion of Lorraine steel production by dismantling Ruhr plants and setting them up in France have met with much criticism in Germany. The German steel association, in a memorandum on the proposals, rejected them as a dangerous burden to the recovery of western Europe.

Under the plan, steel production in Lorraine would be raised by from 4 to 5 million tons, with the necessary plants coming from the Ruhr. Semifinished steel thus produced would have to be shipped back to Germany for further processing. The German view is that this additional French steel production would require about 13 million tons of Lorraine ore, or more than had ever been shipped into Germany before the war. Ore-producing capacity of Lorraine mines would have to be increased about one-third over the 1929-1938 level, and about 10,000 additional French miners would be required. Furthermore, the Ruhr would have to increase its shipments of coal to Lorraine by 3.4 million tons of coke and 2.3 million tons of coking coal, requiring an additional freight car capacity of about 6.55 million tons.

**Economic Waste Cited**—The biggest single disadvantage of the action, the association pointed out, would be that in moving the plants, the Ruhr would lose the surplus furnace gases now resulting from steel production. In addition, by shipping coking coal instead of coke to the Lorraine works, Ruhr industry would lose its coke oven gas. If on the other hand, Lorraine steel has to be processed in the Ruhr, these plants would require new sources of energy and heat, entailing a heavy increase in the processing costs. The important vertical integration of the Ruhr industry, extending from ore and coal through finished steel, would be forcefully disrupted, and cost of steel not only in Germany but also in France would be increased. Also important to overall production would be the loss of phosphorus fertilizers.

Most economic discussions of the proposals seem to indicate they will be quietly dropped in order to concentrate the available financial aid and other resources, envisioned in the Marshall Plan, on the revival of existing facilities all over western Europe in the effort to integrate the continent into an efficient and well-balanced production system.




BRITISH SHOW: This Bailey Bridge exhibit by the British War Office attracted much attention at the first postwar Engineering & Marine Exhibition held at Olympia, London, last month. Towering over surrounding exhibits, the bridge section included two piers carrying a 40-ft span of roadway. About 500 companies displayed products at the show, which occupied 50 per cent more space than the largest prewar exhibition

# Introduces New Light Weight Car Draft Gear

*A. O. Smith Corp. announces unique draft gear made entirely by fabricating and welding rolled steel*

TREND in the railroad field toward lighter weight and stronger and more economical equipment recently received an important contribution in a new freight car draft gear which is unique in two respects—it is the first draft gear made entirely by fabricating and welding rolled steel, and it is the lightest gear ever certified by the Association of American Railroads. In the past, draft gears were made chiefly from steel castings.

The gear, which is being marketed by the Hulson Co. of Keokuk, Iowa, and Chicago, and which was designed by L. M. Clark of this company, is being manufactured by the Railroad Products Division of A. O. Smith Corp., Milwaukee. Announcement of the new product was made Oct. 16 when representatives of several railroads and the press visited the Smith plant to see the gear's fabrication.

**Gets Severe Service**—A draft gear is the unit to which a railroad car coupling is attached and it is the mechanism which absorbs the shock in the motion between cars. It is required to withstand severe impacts and to need no servicing during its life—a period of 15 years and upward.

Assembled and ready for installation on any freight car or locomotive tender, the new gear weighs 202 pounds, or a total of 404 pounds per car set. This car set is stated to be 249 pounds lighter than the average weight of all other draft gears on the market. In a 100-car freight train, the new gear would effect a weight saving of approximately 25,000 pounds or 12.5 tons.

**Developed Plan** — In the early 1930s the Hulson Co. began to think about a stronger and lighter friction draft gear, and after several years of designing and engineering work went to A. O. Smith Corp. with the plan for the new gear. Following exhaustive engineering work in the fields of metallurgy and welding and after manufacturing techniques had been worked out, the present type, known as the Hulson type 202 friction draft gear, was evolved.

An article describing the fabricating and welding operation involved in manufacture of the new gear will appear in an early issue of STEEL.

## RECIPROCAL TRADE

**State Department officials say the logjam which has held up a new reciprocal trade treaty with the United Kingdom has been partially broken as result of British consent to make concessions under the empire preference system to provide freer admission to certain United States products. Official view is expressed that a deal with the British may be concluded by the end of October.**

**Arrangement of a new reciprocal treaty with the British would pave the way for definitive action with a number of other countries. So far reciprocal agreements have been signed only with Norway, Brazil, Lebanon and Chile — that is, 4 of the 18 countries in the program.**

**Arrangements have been concluded to submit to all interested countries, at Havana, Cuba, starting Nov. 21, the tentative charter for International Trade Organization as set up by representatives of 18 countries at Geneva, Switzerland, this year. Some 50 to 60 nations will be represented at Havana. State Department officials are hopeful that final document will emerge from the Havana sessions and thus be ready for submission to Congress in January.**

## Missouri-Illinois Buys Blast Furnace for $3,255,000

The $3,255,000 bid of Missouri-Illinois Furnaces Inc., Granite City, Ill., for two war-surplus blast furnaces and an oven foundry coke plant in Granite City, has been accepted by War Assets Administration.

The corporation was organized recently with half its stock owned by Koppers Co. Inc., which has been operating the plant, and half by Hanna Coal & Iron Corp., affiliated with M. A. Hanna Co., Cleveland. Missouri-Illinois has guaranteed that plant production will not be interrupted and that the same tonnage of pig iron will be available to area users.

# Leece-Neville Co. Starts Volume Production Line

*Manufacturer supplements custom-built electrical equipment items with output of AC and DC motors*

LEECE-NEVILLE CO., Cleveland, builder of specialized electrical equipment for the automotive, aviation, marine, diesel and stationary engine fields, has expanded into a line of volume production items including fractional horsepower AC and DC motors for oil burners and use in the automotive field.

Present DC motor output is 2000 units a day, with an increase to 4000 units anticipated in two to three months. Present AC motor output is 5000 units a month, according to S. Floyd Stewart, executive vice president.

He said the company expects to help spread its overhead by this move; create a more favorable position for its entire line of products; and promote a more continuous flow of business.

**Program Is an Expansion**—Mr. Stewart emphasized that the program is an expansion, and that the custom-built field, in which the company has been previously exclusively engaged, will continue to be the dominant factor in Leece-Neville's operations.

When the firm was founded in 1909 by B. M. Leece, its present president, and the late S. M. Neville, it manufactured generators, cranking motors and controls for automobiles and motor boats. This equipment made electric lighting possible and eliminated hand-cranking. The firm's next major contribution came in 1914 with the first three-brush control generator.

**Other Developments** — The company's developments since World War I include cranking motors for heavy trucks; lightweight, high-output generators for aircraft; cranking motors and generators for busses; design for the magnetic switch; double contact regulators for heavier field currents; voltage regulators for universal installations; two-stage hand-switch starters for Navy emergency diesel engines; and an AC generating system using an alternator, suitable for use on all types of mobile equipment requiring high current output at all engine speeds.

This is no idle promise. It is a proved fact, demonstrated day after day in the production of widely varied parts and products. Three tons of N-A-X HIGH-TENSILE are yielding as many finished units as were previously yielded by *four* tons of carbon sheet steel.

This "new arithmetic in steel" is helping overcome steel shortages for scores of manufacturers. They are taking advantage of N-A-X HIGH-TENSILE'S greater strength and corrosion-resistance to reduce sections an average of 25%—and still provide greater strength and durability than can be obtained with thicker sections of mild-carbon steel.

At a time when America must make fullest use of its steel-producing capacities and conserve its natural resources, the trend to N-A-X HIGH-TENSILE has national significance. Each ton produced represents a potential 33% increase in finished goods. Each ton used enables the manufacturer to get 33% greater usefulness out of his steel supply.

Investigate the opportunity to make each ton of sheet steel go farther—through the superior quality of N-A-X HIGH-TENSILE.

# GREAT LAKES STEEL CORPORATION

**N-A-X ALLOY DIVISION, DETROIT 18, MICHIGAN • UNIT OF NATIONAL STEEL CORPORATION**

COPYRIGHT 1947, GREAT LAKES STEEL CORPORATION

By A. H. ALLEN *Detroit Editor, STEEL*

# Mirrors of Motordom

*Automotive industry gives increasing attention to industrial relations problem, covering both relations between union and management and between white collar workers and management. Seek to improve channels of two-way communication*

*DETROIT*

CONCENTRATED attention is being given by the automotive industry to the many phases of the industrial relations problem, covering not only the relations between top management and union labor but also between management and the great mass of white collar workers—clerks, engineers, statisticians, purchasing personnel and others whose jobs are not on the production line but are nonetheless important to the functioning of the industry. It is being recognized that the links between these people and the directing heads of their respective companies may have become rusty and there exists a need for doing a better job in finding out what the man at the desk is thinking and in making explicit to him the thoughts and philosophy of his superiors. It is a healthy trend.

Witness the letter-writing contest conducted by General Motors among its 300,000 employees on the subject of "My Job and Why I Like It." Over 5000 GM products are being awarded as prizes and there have already been received more than 100,000 replies. Commenting on the contest, one of the judges, Peter F. Drucker, author and economist, observes, "A better understanding of his job, a better understanding of the workers' viewpoint. These are probably the two things most urgently needed in American industrial relations today. Furthering both, this contest promises to make a significant contribution to better worker-management relations and to industrial peace."

Naturally, union leaders have ridiculed the contest and have suggested it should be called, "My Job and Why I Don't Like It." By this very attitude, however, they point up the value of the contest, since if the individual participant can take a few minutes to sit down and do some independent thinking, he may recognize the untenable position of the leaders of his own union who owe their subsistence to their ability to stir up unrest and dissatisfaction.

John S. Bugas, vice president and director of industrial relations at Ford, who is credited with doing a crackerjack job in this position, put the finger on the three major difficulties which the average labor leader in industry faces today. They are:

1. Labor leadership has failed to find out what the rank and file really thinks and really wants, and therefore fails properly to represent them.

2. Many unions are torn by destructive factionalism and internal politics, and

3. The undeniable communist influence.

In a recent address, Bugas cited many specific instances of all three based on his experiences in labor relations at Ford. For example, on the first problem, union leaders worked assiduously for a pension plan, ostensibly representing the wishes of their membership. Yet when a plan was developed and submitted to the membership, it was rejected by an overwhelming majority. Bugas suggests it might be well for union leaders to do the same sort of sampling of any given issue that public opinion polls carry out, and thus have a continuing cross section of the attitude of the rank and file.

On the score of factionalism within the UAW-CIO, it is too well-known and publicized even to mention except in passing. As to the communist influence, Bugas points out that in the recent Ford contract negotiations, the UAW committee had "at least one very able representative of the Communist party who would never make a decision in any of the extremely important issues without thoroughly consulting his principals in the Communist party," with the result that any prospects of negotiation conducted in an atmosphere of reason almost disappeared.

Getting back to management-employee relations at the higher level, it is interesting to note that Packard Motor Car Co. has organized senior and junior management committees, the first in its history, to "strengthen lines of communication between members of management on all matters affecting them as individuals, and on general operations of the company."

L. C. Goad, vice president of General Motors and general manager of the Fisher Body Division, speaking before the American Society of Training Directors recently, urged that top management of industry sit down with employees, and talk with them face to face in simple terms about the profit system, wages, surplus, dividends, and similar phases of the business. He said, "Many men and women are wondering today about whether business and industry, conducted on a capitalistic, competitive, profit-and-loss basis, is in the best interest of everyone concerned. These people definitely are not communists, not even so-called left-wingers. They are the rank and file of any organization. But some of them have misgivings, and these doubts are based on a lack of sufficient straight-forward, honest, truthful information.

"I see no reason why management should be reluctant to discuss these subjects with all employees," he continued, "the desire for such information is completely normal. There is nothing mysterious about such subjects. There is nothing sinister about profits or dividends, and I do not believe that expression of employee interest in them is any indication that employees believe there is anything

## Automobile Production

**Passenger Cars and Trucks—U. S. and Canada**

*Estimates by Ward's Automotive Reports*

| | 1947 | 1946 |
|---|---|---|
| January | 373,872 | 126,082 |
| February | 399,717 | 84,109 |
| March | 441,798 | 140,738 |
| April | 449,388 | 248,108 |
| May | 390,629 | 247,620 |
| June | 418,919 | 216,637 |
| July | 396,932 | 331,100 |
| August | 360,221 | 359,111 |
| September | 452,068* | 342,969 |
| October | | 410,510 |
| November | | 380,664 |
| December | | 380,908 |
| 12 mos. | | 3,268,456 |

* Preliminary.

**Estimates for week ended:**

| | | |
|---|---|---|
| Oct. 4 | 101,608 | 91,925 |
| Oct. 11 | 98,978 | 86,330 |
| Oct. 18 | 87,893 | 89,540 |
| Oct. 25 | 98,000 | 87,680 |

*(Material in this department is protected by copyright and its use in any form without permission is prohibited)*

CASTERED TRUCK BODIES: Designed and patented by Belknap Hardware & Mfg. Co., Louisville, Ky., these castered truck bodies enable each of the company's Mack trucks to do the work of several equipped with conventional bodies. The castered bodies, in the shape of huge freight boxes, can be rolled on or off the truck by means of a rear-mounted winch, powered by the truck engine

dishonest or irregular, they simply want to know more about what makes a business function."

Ford Motor Co. is developing a comprehensive management relations program to improve the channels of two-way communication between top management and junior executives and supervisors. Meetings, training courses and special management letters and publications are used, while a periodic "audit" of employee opinion is made to check the effectiveness of the program. James Irwin, Ford director of public relations, discussed his company's activity in this field before a group of comptrollers in Chicago last week and said significantly: "No matter what channels or media of communication we select to project policies and actions, we should carry through with all the drama and showmanship we can muster. It is up to management to use some of the same thought, talent and flair expended in the merchandising of its products in the promotion of communication with employees and interpretation of policies."

## K-F Expanding Output

Optimism and jubilation are flowing like wine out at Kaiser-Frazer Corp. these days, with salutary effect on the company's common stock which in the space of a few months has soared from around 7 to better than 14. Some 44,000 more cars are expected to be built before the end of the year, which would bring 1947 output to around 138,000. January schedules are aimed at 21,000 and by spring a projection of 1500 cars a day is seen, with perhaps 2500 daily by fall.

Productionwise, other steps are being taken to handle the greater load. As mentioned here last week, a $10 million engine plant is being laid out, with the location probably at Muskegon. This suggests that some of the Continental Motors facilities there will be taken over by K-F, much as the Continental plant in Detroit was leased and $3 million spent on additional equipment. Also in the planning stage is a new manufacturing setup at Willow Run for production of axles and transmissions.

## Curb Highway Transportation

George Romney, managing director of the Automobile Manufacturers Association, believes governments throughout Europe are displaying a penny-wise and pound-foolish attitude toward highway transportation. Based on his observations during a recent two-month trip, he declares that in arbitrarily limiting the use of highway transportation facilities, through curbs on vehicle imports and bans on gasoline use, Europe is heading for increased distribution costs for industrial products at the very time it is confronted with the need for greater exports to build up dollar balances. He adds that the curbs on highway use are but one of the innumerable examples of government restrictions that many European nations are accepting in the belief that they are averting the far more inefficient and debilitating restrictions of complete regimentation under communistic regimes.

## New Military Jeeps

Several unusual military vehicles, hitherto on the secret list, were shown last week at a "cavalcade of jeeps" sponsored by Willys-Overland Motors near Washington. One was the WAC, a 985-lb low-slung unit powered by a 2-cylinder opposed engine, developed for the Army as an airborne unit to be dropped from aircraft by parachute. Another was the Gypsy Rose Lee jeep, a conventional jeep chassis but with body of plywood and otherwise stripped to cut weight from 2200 to 1385 lb. A third was a jungle burden carrier designed to "snake" its way along jungle trails carrying a cargo of 800 pounds. Weight was 550 lb, with 4-wheel drive and 4-wheel steering.

## New Small Car Projected

Two new small car models are planned for the newly organized Keller Motors Corp., headed by George D. Keller, formerly associated with Studebaker Corp. The Keller company has acquired space for manufacturing in the Huntsville Arsenal, Huntsville, Ala., and has acquired the assets of the Bobbi Motor Car Corp. of Birmingham, and design, engineering, manufacturing and merchandising rights from the Dixie Motor Car Corp.

Projected models are the Keller "Super-Chief," with a 49-hp, 4-cylinder engine, and a smaller "Chief." First body style will be a station wagon and second a convertible, with a delivery car to follow.

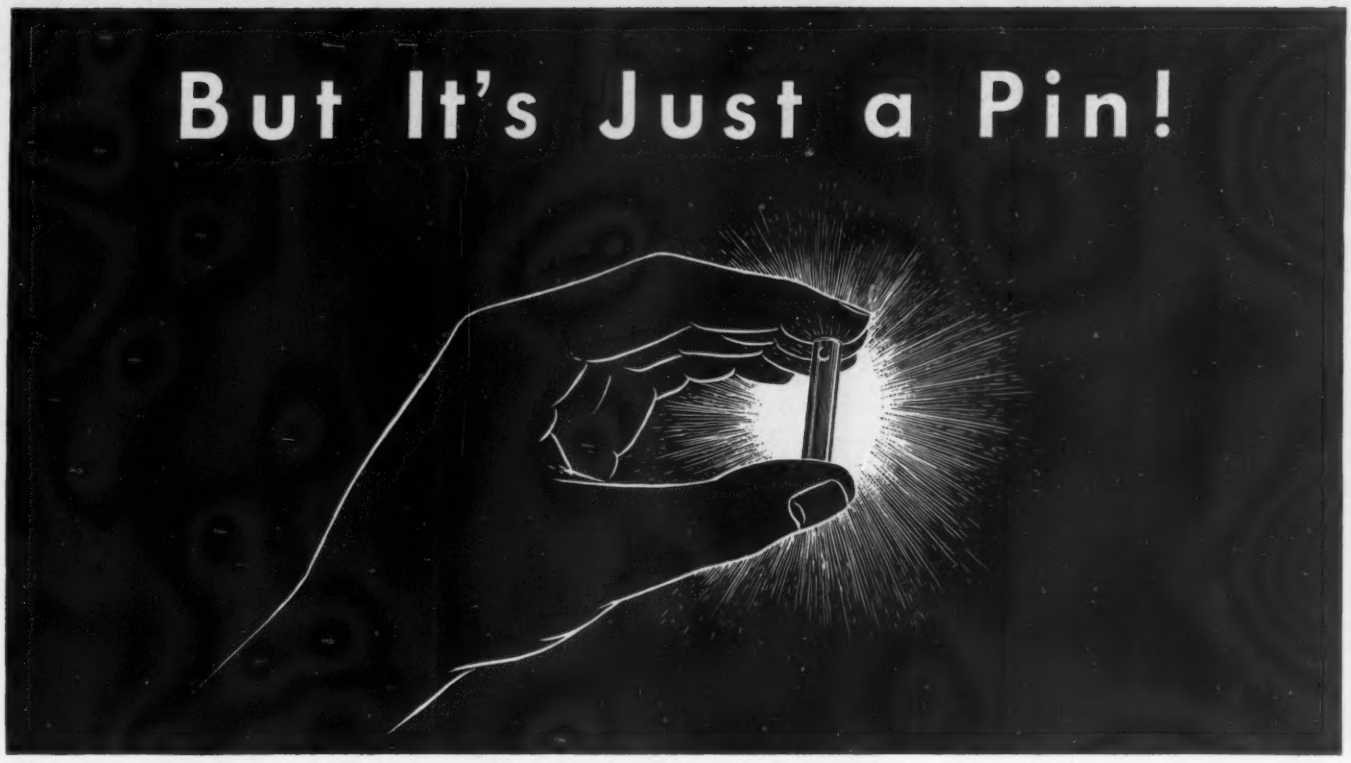
## Tucker Officials Quit

"Tucker's Troubles," the automotive drama in Chicago which is being watched with interest around Detroit, went into its second act last week, featuring the resignation of two more top executives—Hanson A. Brown, executive vice president and secretary, and James D. Stearns, treasurer and controller.

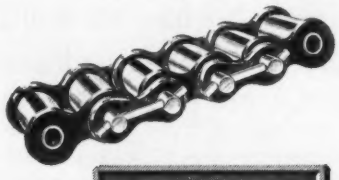
Stearns was replaced by Martin Breitenbach, formerly assistant controller, and Brown was succeeded by Fred Rochelman, formerly vice president in charge of sales.

After resigning, Stearns asked a Senate investigation of the association of War Assets Administration officials with the Tucker Corp. WAA last week announced it had executed a 10-year lease with Tucker for the entire surplus Dodge-Chicago plant.

# But It's Just a Pin!



This short length of UNION roller chain is made up of the 28 separate parts shown below.



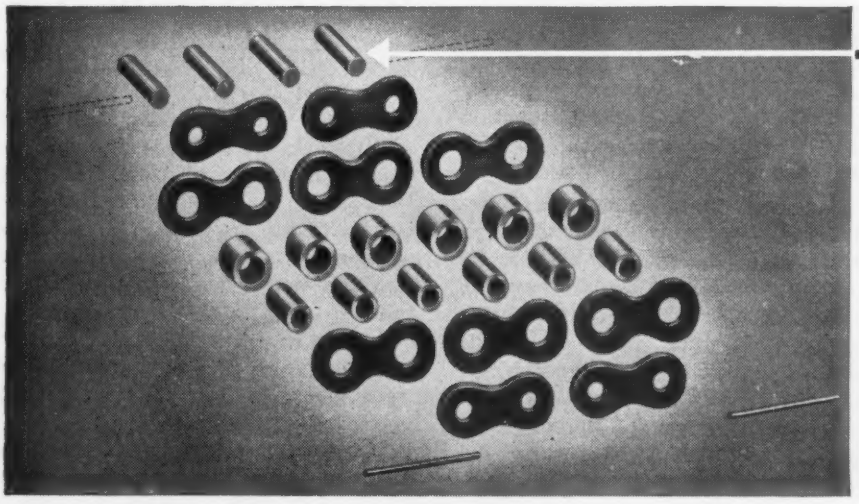
UNION CHAINS

Yes, it's a pin—just a small pin. But it requires 11 distinct and precise operations to make it. For this is a pin for a link of UNION roller chain, and together with the bushings and the rollers it accepts and withstands all the wear that a roller chain is subjected to.

If you will study the "exploded" drawing below you will see that there are 4 of these pins in the short length of UNION roller chain shown at the left. You will also see that there are a total of 28 separate parts in this same length of chain. To make them all, exactly 290 operations are required. And every step from receipt of material to finished product is under the careful supervisory control of an inspection department responsible to the engineering division.

As specialists in the manufacture of sprocket chains, sprockets and attachments (we make nothing else!), we point with some pride to the high standards of skill and precision maintained by our engineers and craftsmen at UNION CHAIN. We are not yet able to meet the overwhelming demand for UNION chain, but we assure our customers and friends that we are making every effort to do so, consistent always with the character of our product and the complicated processes of its manufacture.

**The Union Chain and Manufacturing Company • Sandusky, Ohio**



**THESE 11 OPERATIONS TO MAKE THIS STEEL CHAIN PIN:**

1. straighten stock material
2. cut off to length
3. chamfer ends
4. carburize
5. drill for cotter pin hole
6. re-heat and quench
7. re-heat to refine core structure
8. draw to relieve internal strains
9. rough grind
10. finish grind
11. anneal end for riveting

# Ever-Changing Products Mark Mullins History

*Manufacturer at Salem, O., meets changing conditions of a 75-year period with everything including kitchen sinks*

DEMONSTRATE POURING: Two employees demonstrate pouring in the No. 3 foundry at Hamilton Foundry & Machine Co., Hamilton, O., during open house held Oct. 11 and 12

LONG-RANGE adaptability required of metalworking firms to meet the developments in shifting public demand, faster production methods and technological research is illustrated by Mullins Mfg. Corp., Salem, O., which in its 75-year history has evolved from a small maker of metal statuary to a major producer of steel kitchen equipment.

The firm had its beginnings in 1872 as Kittredge, Clark Co., manufacturer of metal ornaments for buildings. William H. Mullins, formerly a clerk for the Pennsylvania Railroad, bought into the company and by 1890 had become sole owner of a proprietorship called W. H. Mullins. By that year products included metal roofing, ornamental building fronts, ornate cornices and metal statuary for buildings, parks, cemeteries and front lawns. Made from sheet metal utilizing a hot stamping method, the statues were produced by means of a radical departure from usual methods of carving stone or casting solid bronze. The most controversial of the Mullins statues was the nude Diana, which graced the top of the old Madison Square Garden in New York for 25 years despite the protests of women's clubs.

**Depression-born Products**—During the depression of the 1890s Mullins added two products, metal signs and metal boats. The sign business was allowed to lapse in 1906, but the boat business was continued until 1935 when tools, dies and the Mullins trade name were sold to Mullins Boat Co., Oil City, Pa.

By the turn of the century the statuary business was slumping markedly, and although the company kept the statue line until 1928, Mullins started on a new tack. It was the production of automobile stampings, a line which became so important that by 1919 the firm name was changed to Mullins Body Corp. By the mid-1920s shifting conditions had slowed down the automobile contracting business to such extent that still another new product was introduced. In 1925 Mullins began devoting part of its facilities to production of washing machine tubs made of steel with a porcelain enamel covering and using a method of drawing shapes from cold metal instead of stamping them from hot sheets.

**Name Changed Again**—This portion of the Mullins business grew so rapidly and the auto business declined so far that by 1927 the corporation made its final name change, to Mullins Mfg. Corp. During this period the company switched emphasis in its auto stamping business to specialty stamped parts, a line which it still continues today, and it also began production of metal sinks, a forerunner for its current line of steel kitchen equipment.

In an effort to consolidate its financial position, Mullins in 1937 acquired Youngstown Pressed Steel Co., Warren, O., through a deal involving the exchange of some Mullins stock with Sharon Steel Corp., previous owner of Youngstown. The pressed steel firm, which had been a subsidiary of Sharon since 1917, produced auto and agricultural stampings, metal lath, porcelain enameled steel tile, sinks and tubs. Acquisition of the company rounded out Mullins' line of products and facilities.

**Mullins Officers**—Mr. Mullins remained as president and later as chairman of the firm until 1932. He was succeeded by C. C. Gibson who died in 1937. Present officers include: Henry A. Roemer, chairman of the board; George E. Whitlock, president; Harry M. Heckathorn, executive vice president; Charles A. Morrow, vice president in charge of merchandising; Frank M. Beauregard, vice president in charge of operations; Harold F. Wykoff, treasurer and assistant secretary; and Harry Krohne, secretary and assistant treasurer.

## Associated Spring To Build $2 Million Connecticut Plant

Associated Spring Corp., Bristol, Conn., has named Turner Construction Co. builder of a $2 million plant at Forestville, Conn., for Associated Spring's Wallace Barnes Division.

The one-story building will be located three miles from the main plant in Bristol, on land adjoining the company's steel rolling mill. It is expected to be ready for occupancy in about 18 months.

Associated Spring manufactures all types of springs for mechanical purposes, metal stampings and spring assemblies.

## Mexico Buys Silver Mine from U.S. Smelting for $2 Million

Real Del Monte Silver Mine in the state of Hidalgo, Mexico, has been sold to Mexico's financial agency, Nacional Financiera, by U. S. Smelting, Refining & Mining Co. in a transaction involving transfer of a majority of shares in the American firm's Mexican subsidiary for a reported $2 million.

At one time considered the largest silver mining camp in the world, the mine was sold because of increased operating costs, lower grade of ore, reduced reserves in sight and high Mexican taxes on silver.

# BRIEFS . . . .

*Paragraph mentions of developments of interest and significance within the metalworking industry*

**U. S. Navy** and **Maritime Commission** plan to recondition 50 oil tankers in an effort to combat the oil shortage. Ships will be operated by private companies and merchant crews.

—o—

**Bonham Iron Works,** Los Angeles, producer of light structural and ornamental iron work, has been purchased by L. S. Miltimore and L. W. Whiteman.

—o—

**Resistance Welder Manufacturers' Association** has awarded a $750 prize for the second year in succession to Julius Heuschkel, welding specialist at Westinghouse research laboratories, for his paper on metallurgical aspects of carbon steel spot welding.

—o—

**War Assets Administration** is offering more than 100 Whirley Gantry cranes for sale at fixed prices ranging from $5000 to $80,000 each. Most of the equipment is on the West Coast.

—o—

**Alabama** reports that its coal production for the first nine months of this year is 12,627,000 tons, as compared with 11,918,000 tons for the same period in 1946.

—o—

**Joslyn Mfg. & Supply Co.,** Chicago, manufacturer of telephone and power line equipment, has purchased the gray iron foundry of Johnston & Jennings Co. and simultaneously leased it back to Johnston & Jennings. Foundry is surrounded on three sides by the Joslyn plant, and the acquisition was made by the latter to round out its property.

—o—

**War Assets Administration** has sold the maritime facility at Savannah, Ga., formerly operated by Southeastern Shipbuilding Corp., for $357,112 to the Savannah Port Authority and Industrial Committee of Savannah Inc.

—o—

**Sharon Steel Corp.,** Sharon, Pa., has acquired 100 per cent of the stock in Carpentertown Coal & Coke Co. which operates a coal mine and 300 beehive coke ovens in Carpentertown, Pa. Sharon had owned half the stock in the company and acquired the rest for $213,025.

—o—

**Federal Machine & Welder Co.,** Warren, O., manufacturer of welding machinery, has changed three of its wholly owned subsidiaries into divisions of the parent company. They are Warren City Mfg. Co., Warren Stamping Co. and Taylor-Hall Welding Co., all of Warren.

—o—

**Haydon Mfg. Co. Inc.,** subsidiary of General Time Instruments Corp., has moved from Forestville, Conn., to 245 E. Elm St., Torrington, Conn. Firm makes timing motors and offers a timing engineering service.

—o—

**Gordon Armstrong Co.,** Cleveland, engineering firm and distributor for commercial and industrial ventilators and hospital equipment, has changed its name to Gordon Armstrong Co. Inc.

—o—

**Southwest Research Institute,** San Antonio, Tex., has been formed as a non-profit scientific organization designed to aid southwestern industry solve its technological problems. Endowed with over $1 million by Tom Slick, Texas oil man, the institute is organized along lines similar to Midwest, Armour and Mellon institutes.

—o—

**Snow Mfg. Co.,** maker of air tapping and drilling equipment, will move to its new factory at 435 Easter Ave., Bellwood, Ill., on Nov. 1.

—o—

**Graham-Paige Motor Corp.,** Willow Run, Mich., has introduced a lightweight gasoline motor for farm, home and light industrial applications. Priced at about $150, the five hp engine is said to be able to run from six to eight hours on two gallons of gasoline.

—o—

**Crucible Steel Co. of America,** New York, announces the physical consolidation of its Sanderson and Halcomb plants in Syracuse, N. Y., will take place Nov. 1 instead of March 31, 1948, as originally planned.

—o—

**Progressive Welder Co.,** Detroit, maker of resistance welding equipment, has appointed Benkert & Duer Inc., Columbus, O., as its sales representative for most of Ohio, western Pennsylvania, northern Kentucky, West Virginia and most of Indiana.

—o—

**Hinderliter Tool Co. Division,** Tulsa, Okla., H. K. Porter Co. Inc., has acquired all manufacturing rights for "Nail-It" pipe couplings, mud guns, swivel joints and pump suction couplings which the division will manufacture under the trade name of "Nail-It-Kwik."

—o—

**North American Philips Co. Inc.,** New York, manufacturer of scientific and technical equipment, will hold a course in x-ray diffraction and spectrometry at its New York office Nov. 17-21.

—o—

**Abbott Ball Co.,** Hartford, Conn., is adding new equipment for increasing capacity to produce carbon steel balls.

—o—

**National Materials Handling Exposition,** scheduled in Cleveland next Jan. 12-16, has sold all its allotted space. The opening of additional exhibition areas is under consideration.

—o—

**Solar Aircraft Co.,** San Diego, Calif., has opened an office at 1025 Connecticut Ave. N.W., Washington, with Grant B. Stone in charge.

—o—

**Vacuum Cleaner Manufacturers' Association,** Cleveland, reports that 328,360 vacuum cleaners were sold in September, which was almost 18 per cent above the number sold in August and 52 per cent over the quantity sold in September, 1946.

—o—

**Dual Press Co.,** St. Louis, manufacturer of a brake press for bending, forming, blanking and multiple punching, has appointed Machinery & Welder Corp., St. Louis, as its national distributor for sales and servicing. A Dual Brake Press Division of Machinery & Welder has been formed to handle the assignment.

—o—

**General Electric Co.,** Schenectady, N. Y., received orders totaling $912,090,000 for the first nine months of this year. This represents an increase of 39 per cent over the corresponding period last year.

—o—

**Avondale Marine Ways Inc.,** New Orleans, is outfitting three tugs which the Brazilian Navy recently acquired from the United States.

—o—

**B. F. Goodrich Co.,** Akron, has established a Plastic Materials Sales Division under the general managership of L. H. Chenoweth. The division will be in charge of sales of all plastic materials the company handles.

—o—

**Ampco Metal Co. Inc.,** Milwaukee, has appointed Welding & Supply Co., Cleveland, as distributor of the firm's resistance welding electrodes and alloys in the Cleveland area.

# The Business Trend

## Industrial Rate Cut by Setback In Auto Output

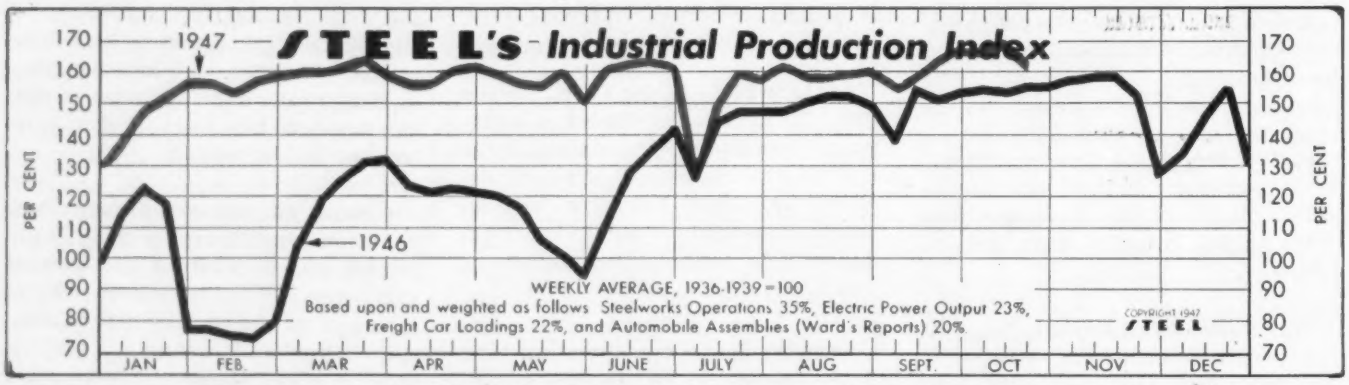
BLEMISHED only by inability of the auto building industry to keep weekly production steady at the 100,000-plus unit level, operations of the nation's basic industries are booming along at peacetime rates far in excess of those projected in the early postwar period. STEEL's industrial production index for the week ended Oct. 18 at 162 per cent (preliminary) of the 1936-1939 weekly average, although four points below the postwar peak recorded during the weeks ended Sept. 27 and Oct. 11, this year, indicates the high level of activity being sustained by domestic manufacturers and commercial businesses.

Currently the value of goods produced and services performed is at the highest level in history. This gross national product during the first half of 1947 was valued on an annual rate at $225 billion, higher than at the peak of the war and two and one-half times the value produced in 1939. Estimates by the Federal Reserve Bank of Cleveland, however, attribute somewhat less than half the increase between the two years to increased supplies of all goods and services and somewhat more than half to higher prices. Some indeterminate part of the increase also reflects the shift in purchases to higher quality goods.

**CARLOADINGS**—Loading of revenue freight in the week ended Oct. 11 totaled 956,862 cars, the highest for any week in more than 17 years. This figure, compiled by the Association of American Railroads, is only 2.8 per cent below the alltime peak, but in view of heavier loadings, faster movement and longer hauls now than at that time, the current volume of car load traffic, measured in ton-miles, is approximately 70 per cent greater than in the peak week of loadings.

**ELECTRIC POWER**—The highest total of electric utility system peak loads this year was reached in August, the latest month for which the Federal Power Commission has obtained figures. This aggregate of peak loads was 43,057,487 kilowatts, compared to a wartime maximum of 38,252,630 kilowatts in January, 1945, and the record high of 43,173,808 in December, 1946. Corresponding energy requirements for August reached a record 21,393,348,000 kilowatt-hours, compared with the previous record of 21,251,040,000 kwh in January, 1947.

**AUTOS**—Production of automobiles and trucks in the United States and Canada in the week ended Oct. 18 was estimated at 87,893 units. One major producer, which had almost completely shut down because of insufficiency of steel and whose production loss was responsible for most of the drop in total output, resumed work last week at close to full-scale operation with indications it can maintain the same pace for the remainder of the year. Celebration of Thanksgiving Day in Canada in that week also had an adverse effect on the industry's total output.




**The Index (see chart above): Latest Week (preliminary) 162 Previous Week 166 Month ago 164 Year Ago 155**

## FIGURES THIS WEEK

| INDUSTRY | Latest Period* | Prior Week | Month Ago | Year Ago |
|---|---|---|---|---|
| Steel Ingot Output (per cent of capacity)† | 96.0 | 95.5 | 87.5 | 90.5 |
| Electric Power Distributed (million kilowatt hours) | 4,946 | 4,958 | 4,977 | 4,540 |
| Bituminous Coal Production (daily av.—1000 tons) | 2,125 | 2,032 | 2,100 | 2,086 |
| Petroleum Production (daily av.—1000 bbl.) | 5,268 | 5,245 | 5,200 | 4,733 |
| Construction Volume (ENR—Unit $1,000,000) | $91.3 | $93.0 | $90.6 | $108.2 |
| Automobile and Truck Output (Ward's—number units) | 87,893 | 98,978 | 109,734 | 89,540 |

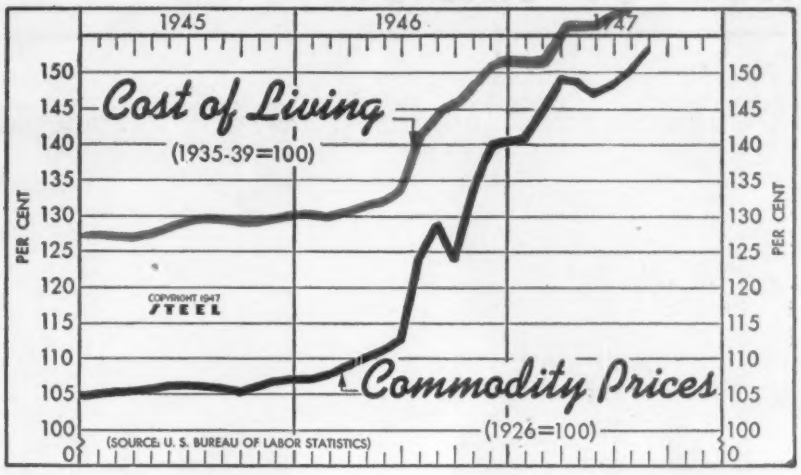
* Dates on request. † 1947 weekly capacity is 1,749,928 net tons. 1946 weekly capacity was 1,762,381 net tons.

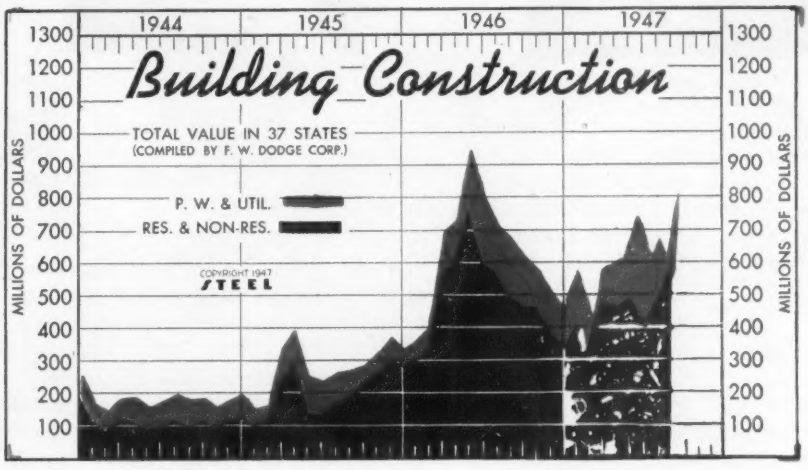
| TRADE | | | | |
|---|---|---|---|---|
| Freight Carloadings (unit—1000 cars) | 950† | 957 | 931 | 932 |
| Business Failures (Dun & Bradstreet, number) | 75 | 62 | 73 | 23 |
| Money in Circulation (in millions of dollars)‡ | $28,656 | $28,632 | $28,633 | $28,597 |
| Department Store Sales (change from like wk. a yr. ago)‡ | +8% | +18% | —1% | +15% |

† Preliminary. ‡ Federal Reserve Board.

### Wholesale Commodity Price—Cost of Living Indexes

| | —Commodities— (1926 = 100) | | | —Living Cost— (1935-39 = 100) | | |
|---|---|---|---|---|---|---|
| | 1947 | 1946 | 1945 | 1947 | 1946 | 1945 |
| Jan. | 141.5 | 107.1 | 104.9 | 153.3 | 129.9 | 127.1 |
| Feb. | 144.5 | 107.7 | 105.2 | 153.2 | 129.6 | 126.9 |
| Mar. | 149.5 | 108.9 | 105.3 | 156.3 | 130.2 | 126.8 |
| Apr. | 147.7 | 110.2 | 105.7 | 156.2 | 131.1 | 127.1 |
| May | 147.1 | 111.0 | 106.0 | 156.0 | 131.7 | 128.1 |
| June | 148.0 | 112.9 | 106.1 | 157.1 | 133.3 | 129.0 |
| July | 150.8 | 124.7 | 105.9 | 158.4 | 141.2 | 129.4 |
| Aug. | 153.6 | 129.1 | 105.7 | .... | 144.1 | 129.3 |
| Sept. | .... | 124.0 | 105.2 | .... | 145.9 | 128.9 |
| Oct. | .... | 134.1 | 105.9 | .... | 148.6 | 128.9 |
| Nov. | .... | 139.7 | 106.8 | .... | 152.2 | 129.3 |
| Dec. | .... | 140.9 | 107.1 | .... | 153.3 | 129.9 |
| Ave. | .... | 120.9 | 105.8 | .... | 139.3 | 128.4 |




### Construction Valuation in 37 States

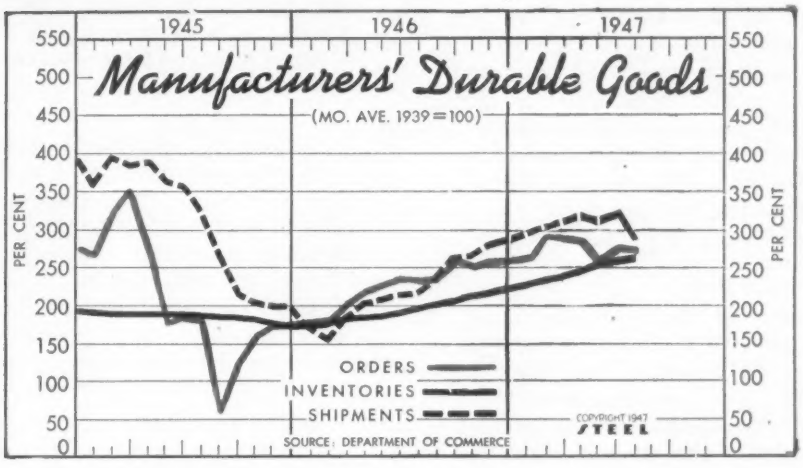
(Unit—$1,000,000)

| | Total | Public Works Utilities | | Residential and Non-residential | |
|---|---|---|---|---|---|
| | 1947 | 1947 | 1946 | 1947 | 1946 |
| Jan. | 571.6 | 113.9 | 50.2 | 457.7 | 307.3 |
| Feb. | 442.2 | 90.5 | 64.7 | 351.6 | 322.7 |
| Mar. | 596.8 | 122.0 | 143.6 | 474.8 | 554.0 |
| Apr. | 602.3 | 161.4 | 128.1 | 441.0 | 606.8 |
| May | 742.8 | 252.9 | 197.9 | 490.0 | 754.6 |
| June | 605.1 | 185.7 | 202.5 | 419.4 | 605.5 |
| July | 660.3 | 165.9 | 153.1 | 494.4 | 564.9 |
| Aug. | 823.2 | 223.5 | 184.4 | 599.7 | 495.6 |
| Sept. | .... | .... | 156.4 | .... | 463.5 |
| Oct. | .... | .... | 112.8 | .... | 460.4 |
| Nov. | .... | .... | 121.8 | .... | 382.0 |
| Dec. | .... | .... | 115.9 | .... | 341.4 |
| Total | .... | .... | 1,631.4 | .... | 6,858.7 |

### Index of Manufacturers' Durable Goods

(Mo. Ave. 1939=100)

| | Orders | | Shipments | | Inventories | |
|---|---|---|---|---|---|---|
| | 1947 | 1946 | 1947 | 1946 | 1947 | 1946 |
| Jan. | 270 | 176 | 292 | 169 | 226 | 171 |
| Feb. | 295 | 179 | 311 | 153 | 232 | 174 |
| Mar. | 288 | 203 | 312 | 183 | 238 | 181 |
| Apr. | 279 | 219 | 320 | 203 | 244 | 182 |
| May | 256 | 224 | 313 | 207 | 251 | 184 |
| June | 270 | 231 | 323 | 212 | 254 | 189 |
| July | 262 | 229 | 287 | 216 | 256 | 195 |
| Aug. | ... | 232 | ... | 233 | ... | 200 |
| Sept. | ... | 254 | ... | 259 | ... | 206 |
| Oct. | ... | 248 | ... | 262 | ... | 211 |
| Nov. | ... | 254 | ... | 278 | ... | 215 |
| Dec. | ... | 271 | ... | 292 | ... | 220 |
| Ave. | ... | 227 | ... | 222 | ... | 194 |




## FINANCE

| | Latest Period* | Prior Week | Month Ago | Year Ago |
|---|---|---|---|---|
| Bank Clearings (Dun & Bradstreet—millions) | $11,273 | $13,258 | $13,723 | $11,482 |
| Federal Gross Debt (billions) | $259.2 | $259.8 | $259.0 | $263.7 |
| Bond Volume, NYSE (millions) | $22.2 | $21.9 | $17.7 | $27.3 |
| Stocks Sales, NYSE (thousands) | 6,884 | 5,256 | 4,180 | 7,839 |
| Loans and Investments (billions)† | $64.7 | $64.8 | $64.3 | $58.2 |
| United States Gov't. Obligations Held (millions)† | $38,374 | $38,400 | $38,699 | $39,187 |

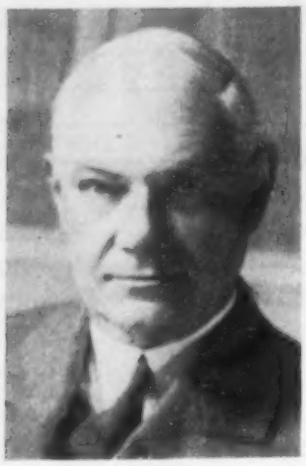
† Member banks, Federal Reserve System.

## PRICES

| | | | | |
|---|---|---|---|---|
| STEEL's composite finished steel price average | $75.41 | $75.41 | $75.41 | $64.45 |
| All Commodities† | 158.0 | 157.1 | 157.4 | 126.0 |
| Industrial Raw Materials† | 175.0 | 172.9 | 171.9 | 146.3 |
| Manufactured Products† | 151.7 | 151.4 | 152.5 | 118.6 |

† Bureau of Labor Statistics Index, 1926=100.

# Men of Industry



QUINCY BENT

STEWART J. CORT

V. R. BILLINGS

**Quincy Bent,** vice president in charge of operations, Steel Division, Bethlehem Steel Co., Bethlehem, Pa., will retire Nov. 1, after devoting 47 years of his business life to the industry's development. As vice president in charge of the Steel Division operations, he has been responsible for the steel plant and fabricating works development and activities, including the work of industrial research. He has also been a director of Bethlehem Steel Corp. and of many of its subsidiaries, and as such has been active in the management of the corporation. Mr. Bent will continue as vice president in an advisory and consulting capacity, and as a director of the corporation until Dec. 31. He is succeeded as vice president of the Steel Division by **Stewart J. Cort,** who has been associated with the corporation since 1917. Since 1928 he has been general manager of the Sparrows Point, Md., plant. **C. E. Clarke,** general manager of the Steelton, Pa., plant, succeeds Mr. Cort at Sparrows Point, and **W. B. Lang,** assistant general manager of the Steelton plant, has been promoted to general manager of that plant.

—o—

**Paul W. Pheneger** has been appointed superintendent of finishing, packaging, shipping and traffic for the Carnegie, Pa., plant of Superior Steel Corp., Pittsburgh. He formerly had been general superintendent of Michigan Seamless Tube Co., South Lyon, Mich.

—o—

**F. E. Newbold Jr.,** assistant manager of engineering operations, has been appointed manager of engineering operations of Ranger Aircraft Engines Division, Fairchild Engine & Airplane Corp., New York. He will fill the position vacated by **Andrew L. Pomeroy,** who is leaving the Ranger organization to become associated with Thompson Products Inc., Cleveland.

—o—

**E. W. Deck,** formerly general manager of Trent Tube Mfg. Co. at East Troy, Wis., and a wartime administrative official for the Manhattan Project, has been named manager of the Ithaca, N. Y., plant of Morse Chain Co., a division of Borg-Warner Corp., Chicago. The appointment will become effective Nov. 15.

—o—

Kennecott Copper Corp., New York, announces the election of **Robert L. Coe** as vice president of the corporation in charge of all fabricating subsidiaries, including Chase Brass & Copper Co. Inc., and Kennecott Wire & Cable Co. Mr. Coe has been a vice president of Kennecott Copper Corp., in charge of fabricating sales.

—o—

**B. D. Claffey** has resigned as a director and manager of General Malleable Corp. at Waukesha, Wis., to accept the vice presidency and general managership of Acme Aluminum Industries, Dayton, O. His resignation becomes effective Dec. 1. Mr. Claffey organized the Claffey Castings Co. in 1933, and in 1936 it became the Gray Iron Division of General Malleable, which Mr. Claffey joined in his present position.

—o—

**Cleland S. Baker,** president, general manager, and treasurer of the Baker Mfg. Co., Evansville, Wis., has resigned because of ill health, but will continue as a member of the board. **R. B. Townsend,** who recently returned to Evansville from a position with the company in Omaha, Nebr., will fill the position of treasurer.

—o—

**V. R. Billings** has been appointed advertising and sales promotion manager for the industrial materials handling department of Conco Engineering Works, Mendota, Ill. For the past two years, Mr. Billings served as sales engineer of materials handling equipment for Consolidated Sales Co. in its Kansas City, Mo., territory.

—o—

**Byron C. Foy,** chairman of the board, Jack & Heintz Precision Industries Inc., Cleveland, has been elected president of the corporation, succeeding **William S. Jack.** Mr. Foy will continue to serve as chairman. **Albert A. Ricker,** vice president in charge of finance, has been appointed to the newly-created position of assistant to the president. He became vice president in charge of finance of Jack & Heintz Precision Industries in 1946 when the company was formed by the merger of Jack & Heintz Inc. into Precision Products Corp. He will retain that position while fulfilling his new duties as assistant to the president.

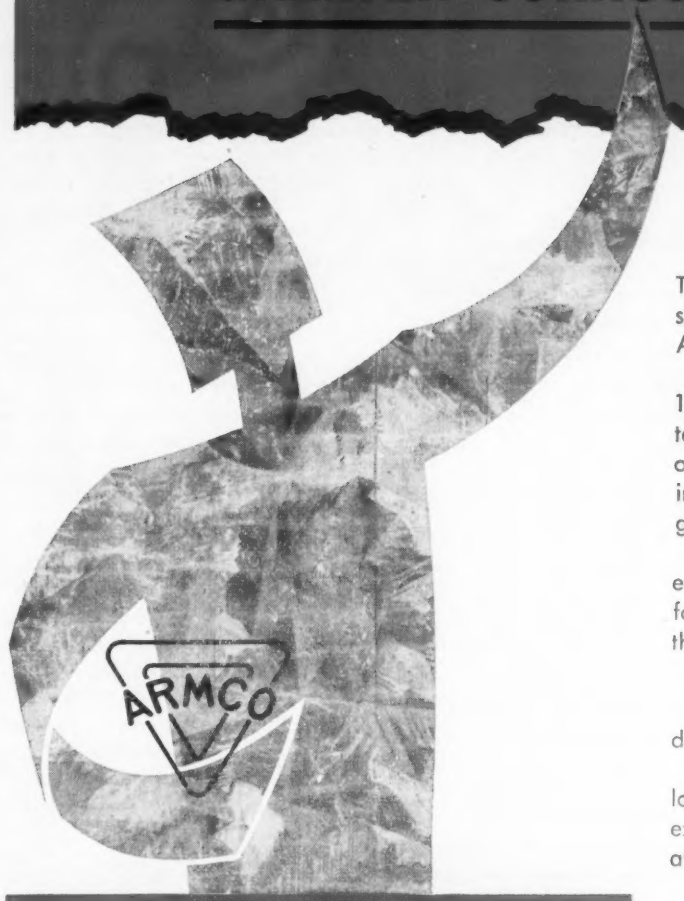
—o—

**William C. Wolfe,** who some years ago was general manager, Highland Iron & Steel Co., Chicago, following that vice president, Reading Iron Co., Philadelphia, and during World War II associated with Douglas Aircraft Co., Park Ridge, Ill., recently became associated with Max Schlossberg Co., Chicago.

—o—

Dravo Corp., Pittsburgh, announces appointment of **J. Carl Bowen** as West Coast sales and service man-

# This Special Zinc Coating Offers 15 to 45% GREATER CORROSION RESISTANCE




This range of 15 to 45% greater atmospheric corrosion resistance than regular galvanized coatings is the record of ARMCO ZINCGRIP in *actual field tests.*

When Armco Research engineers perfected ZINCGRIP in 1936, they knew this revolutionary zinc-coated steel would take severe forming and drawing without peeling or flaking of the special zinc coating. And accelerated laboratory tests indicated ZINCGRIP had another important advantage—much greater corrosion resistance than regular galvanized steel.

But in line with Armco's established testing policies these engineers put ZINCGRIP on the toughest proving grounds for metals—years of *actual field tests.* Only in this way could they be *sure* of ZINCGRIP'S superior corrosion resistance.

**EXPOSURE TESTS**

Exposure tests were made in various corrosion yards in different kinds of atmosphere.

ARMCO ZINCGRIP coatings averaged much less weight loss than the regular galvanized coatings among samples exposed for four years to both mild industrial and seacoast atmospheres. (See Table.)

After six years in a mild industrial atmosphere yellow rust appeared on *all* the regular galvanized specimens with a 1-ounce coating, but there was no indication of rust on *any* ZINCGRIP samples, including those with a 1-ounce coating.

Tests made by The American Zinc Institute with stock-watering tanks also show that ARMCO ZINCGRIP has *marked superiority* over regular galvanized in underwater exposure.

★ ★ ★ ★ ★

ZINCGRIP is only one of Armco's Special-Purpose Steels. Others include Stainless Steel sheets, strip, plates, bars and wire, and ALUMINIZED Steel (the only sheet steel with an aluminum coating). The American Rolling Mill Company, 402 Curtis Street, Middletown, Ohio.

**WEIGHT LOSS COMPARISONS**

(Five specimens used for each atmosphere test)

| MATERIAL | LOCATION | TIME OF EXPOSURE | AV. WT. LOSS (GRAMS) |
|---|---|---|---|
| Galvanized | Industrial Atmosphere | 4 years | 1.84 |
| ZINCGRIP | Industrial Atmosphere | 4 years | 1.60 |
| Galvanized | Industrial Atmosphere | 4 years | 2.42 |
| ZINCGRIP | Industrial Atmosphere | 4 years | 1.68 |
| Galvanized | Seacoast | 4 years | 2.00 |
| ZINCGRIP | Seacoast | 4 years | 1.74 |

**Help keep steel flowing from the mills by turning in your scrap promptly. The need is critical—the shortage *greater* than during the war.**

THE AMERICAN ROLLING MILL COMPANY **ARMCO ZINCGRIP**

ager for the heating & air conditioning section of the industrial department. He will have headquarters in San Francisco.

—o—

**J. R. Corbett,** president, Cato Oil & Grease Co., Oklahoma City, Okla., was elected president, National Lubricating Grease Institute. **B. F. Symon,** manager, lubrication sales, Shell Oil Co. Inc., New York, was named vice president.

—o—

**Louis Lyon Jr.,** formerly Pittsburgh district sales manager of National Refractories Co., Philadelphia, has formed his own organization, Lyon & Co., with offices in the Park Bldg., Pittsburgh. He will represent several manufacturers of refractory products.

—o—

**Clarence Snyder,** president, Snyder Tool & Engineering Co., Detroit, has been named chairman of the board. With more than 50 years in the machine tool business, Mr. Snyder has been a key figure in the automobile industry. He is succeeded as president by **Howard N. Maynard,** formerly vice president and treasurer, who retains the latter position. **Kenneth B. Hollidge** becomes vice president and secretary, and also a director of the company.

—o—

**James D. Glenn** has resigned his position as vice president in charge of sales, Eastern Stainless Steel Corp., Baltimore. **Robert G. Leary** has been appointed general sales manager of the corporation. Mr. Leary joined Eastern in 1936, and has served as manager of various branch offices of the corporation since that time. Following his return from service in the Army, Mr. Leary has been the corporation's export and New York branch sales manager.

—o—

**L. H. Chenoweth** has been named general manager of a new plastics materials sales division of the B. F. Goodrich Co., Akron, which is a unit separate from the company's Industrial Products Division. **Gerald L. Lawrence** has been named credit manager of the Associated Lines Division of the company. **P. W. Stansfield** has been named manager of passenger car tire sales of the Replacement Tire Sales Division.

—o—

Cincinnati Milling Machine Co. and Cincinnati Grinders Inc., Cincinnati, have begun serving their customers in Indiana through their sales subsidiary, Cincinnati Milling & Grinding Machines Inc., with a new direct field engineering office located in Room 218, Chamber of Commerce Bldg., Indianapolis. **Arthur Meals** and **Charles Williams** will work out of this new office, which is under the supervision of **Howard L. Pope,** manager of the Cincinnati-Indiana territory. **Bruce Mintern** will continue to work out of the Cincinnati office.

—o—

**Elwyn T. Gants** has been named assistant superintendent, Brier Hill coke plant, Youngstown Sheet & Tube Co., Youngstown, to succeed **R. R. Eppley,** who recently became superintendent. Mr. Gants has been general foreman of the Campbell by-products and benzol plant.

—o—

**John Yetter,** Link-Belt Co., Chicago, has been appointed district sales engineer, Ball & Roller Bearing Division, with headquarters at the company's plant in Dallas, Tex. He will specialize on the application of ball and roller bearings to oil field operating equipment.

—o—

Fairbanks, Morse & Co., Chicago, announces the following changes and addition of personnel in the Railroad Division: **H. L. Gebhard** has joined the Fairbanks-Morse organization as sales engineer, with headquarters in the Chicago office. **C. B. O'Neil,** who for many years has been manager of the railroad department at St. Louis, has now also taken over the duties formerly handled by **Frank Ross.** In addition to the sales of the company's railroad equipment, he will handle diesel locomotive sales for the company in the St. Louis area and Southwest.

—o—

A. M. Byers Co., Pittsburgh, has named **Paul S. Park** as manager of the engineering service department. Besides handling engineering problems dealing with the use of wrought iron pipe and plate in industrial, marine, railroad, refrigeration, construction, petroleum, sewage and waterworks fields, this department has been instrumental in the development of radiant heating and snow melting systems.

—o—

The Southeastern Chapter of the Institute of Scrap Iron & Steel Inc. elected the following officers: President, **Irving Levin,** Superior Iron & Metal Co., Jacksonville Fla.; first vice president, **Louis B. Cline,** Cline & Bernheim, Nashville, Tenn.; second vice president, **Max Kimerling,** M. Kimerling & Sons, Birmingham; third vice president, **H. T. Herndon,** J. T. Knight & Sons Inc., Atlanta; and secretary-treasurer, **Herbert Luria III,** Luria Bros. & Co. Inc., Birmingham.

—o—

**R. S. Kersh,** formerly manager of the Houston office of Westinghouse Electric Corp., has been named to succeed **J. E. Payne** as manager of industrial sales for the corporation. Mr. Payne was recently named manager of all industry sales departments.

—o—

MacDermid Inc., Waterbury, Conn., has announced the opening of a Los Angeles office and warehouse. **G. Stuart Krentel,** former Chicago manager, has been appointed West Coast manager. His heaquarters will be at 1011 S. Los Angeles St., Los Angeles. He has been associated with the plating industry in production and in sales and service work since 1933.

—o—

**Lloyd W. Foutz,** treasurer and vice president, Haney Corp., Philadelphia, has been elected to the board of the company, which manufactures tractors and farm implements.

—o—

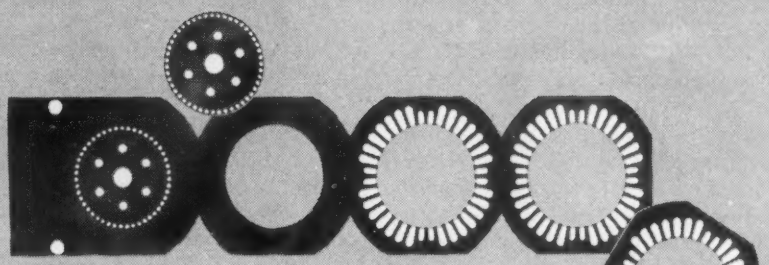
**M. J. Walker,** sales manager, has been appointed vice president in

PAUL S. PARK

G. STUART KRENTEL

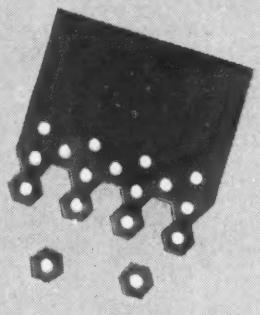
# Why You Increase Output and Cut Costs

# On *Bliss* High-Production Presses



.018" silicon steel—200 SPM in a No. 675-B press with single roll feed and synchronized pull feed.

.089" steel—165 SPM in a No. 675 press—two pieces per stroke.



.132" brass—300 SPM in a No. 630 press with single roll feed.

### *CHECK THESE FEATURES*

**Eliminate lost man-hours from intermediate handling between operations**—Bliss High-Production Presses are specially engineered for Progressive and Compound Dies...increase output per man.

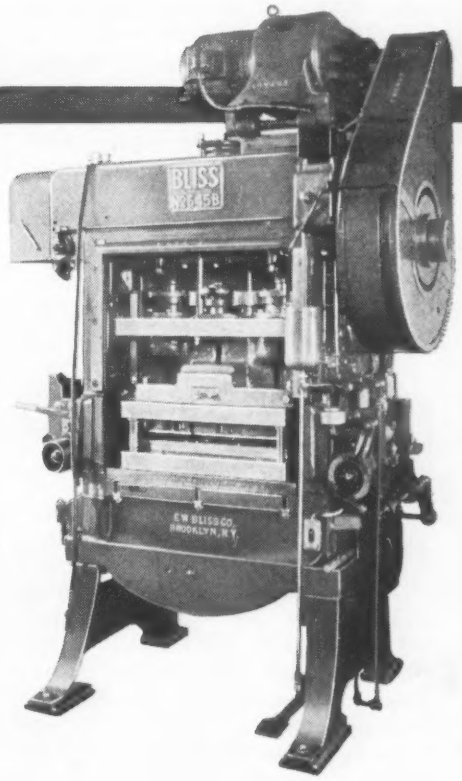
**Minimize set-up time**—all dies and adjustments are within easy reach of operator.

**Control Speed and production ratio** within the limit of tool and maintenance economy.

**Step up operating pace with special feeds.** Double roll or single roll feed can be mounted on right or left side of press.

**Increase Die Life**—slide alignment is maintained even under severe off-center loads through use of two connections and square gibbing...accurately finished.

**Keep Down-time and Maintenance at a minimum**—parts are easily accessible. Forced feed lubrication to all main bearings. Electric controls to supplement operator when press operates at high speed.




You don't have to speed up a Bliss High-Production Press until it cries "Uncle" to increase output and cut costs. In engineering it, Bliss didn't stop with increased strokes per minute but, what's more important, made possible higher ratio of productivity...greater press output. Some of the ways this is accomplished on Bliss High-Production Presses are enumerated in the above chart. Check your performance against it.

The accompanying examples show complex work achieved with one stroke, one press, one man. These are but a few of the stampings produced on Bliss High-Production Presses. You, too, can increase your output and reduce costs. Start by writing today for our catalog No. 27.

**E. W. BLISS COMPANY, DETROIT 2, MICH.**

**Mechanical and Hydraulic Presses, Rolling Mills, Can and Container Machinery**

WORKS AT: Brooklyn, N. Y.; Toledo, Cleveland, Salem, Ohio; Hastings, Mich.; Derby, England; St. Ouen sur Seine, France.

SALES OFFICES: Detroit; New York; Brooklyn; Cleveland, Dayton, Ohio; Hastings, Mich.; Chicago; Philadelphia, Pittsburgh, Pa.; Rochester; New Haven; Boston; Windsor, Ont.

STAY AHEAD WITH *Bliss*

**BLISS BUILDS MORE TYPES AND SIZES OF PRESSES THAN ANY OTHER COMPANY**

charge of sales, Pioneer Gen-E-Motor Corp., Chicago, manufacturer of power and hand lawn mowing equipment, electric hedge trimmers and electric power plants.

—o—

Three Bethlehem Steel officials awarded the President's Certificate of Merit at the U. S. Navy Department for their outstanding contributions to the Navy shipbuilding and repair programs during World War II are: **Arthur B. Homer,** president, Bethlehem Steel Co., Bethlehem, Pa.; **W. H. Collins,** vice president in charge of Bethlehem's Shipbuilding Division, and **John M. Willis**, general manager of the Baltimore district of the Shipbuilding Division.

—o—

**John O. Medford** has been appointed sales engineer, Superior Foundry Inc., Cleveland. He formerly had been with the Dayton, O., Division of Chrysler Corp.

—o—

**Joseph E. Moody** has been elected president of the Southern Coal Producers' Association, to assume duties Nov. 1. He is manager of industrial relations for the York Corp., York, Pa.

—o—

The Chicago Chapter of the Institute of Scrap Iron & Steel Inc., Washington, elected the following officers: President, **William Pohn,** Pohn Iron & Steel Co., Chicago; first vice president, **Frank K. Grossman,** Grossman Bros. Co., Milwaukee; second vice president, **E. R. Mitchell,** Chicago Metals Co., Chicago; third vice president, **Barney Silver,** Silver Steel Co., Racine, Wis.; secretary, **Harvey Kaplan,** M. S. Kaplan Co., Chicago; treasurer, **Henry Rosenthal,** Briggs & Turivas Inc., Blue Island, Ill. **Harold Weinstein,** Calumet Iron & Supply Co., East Chicago, Ind., has been elected chairman of the executive committee.

—o—

**J. O. Jackson,** president, Jackson Industries Inc., Birmingham, has been appointed to the budget and finance committee of the Gray Iron Founders' Society.

—o—

Babcock & Wilcox Tube Co., Beaver Falls, Pa., subsidiary of Babcock & Wilcox Co., New York, announces the appointment of **Frederick H. Foglesong** to the staff of its Detroit district sales office. He formerly had been connected with the Steel & Tube Division of the Timken Roller Bearing Co. in the Detroit office.

—o—

The Seaboard Chapter, Institute of Scrap Iron & Steel Inc., Washington, re-elected the following officers: President, **Harry Kerstein,** Maryland Pipe & Metals Co., Hagerstown, Md.; vice president, **Joseph Shapiro,** Cambridge Iron & Metal Co., Baltimore; secretary-treasurer, **Nathan Brenner,** Joseph Brenner & Son, Baltimore.

—o—

**Gustav F. Watters** has been elected to the newly-created position of executive vice president of the Niagara Falls Power Co., Niagara Falls, N. Y. He was also named a director.

—o—

**Ralph Nordquist** has been named eastern regional manager for Crosley Division, Avco Mfg. Corp., Cincinnati. **Joseph A. McLaughlin** has been appointed east central division manager.

—o—

**Edward B. Gallaher,** president, Clover Mfg. Co., Norwalk, Conn., received the Crowell Gold Medal from the Army Ordnance Association for distinguished ordnance service.

—o—

**Edward C. Huerkamp,** sales manager, Lighting Division, Westinghouse Electric Corp., Pittsburgh, has been named to act as chairman of the Second International Lighting Exposition & Conference, to be held in Chicago, Nov. 3-7, which is sponsored by the Industrial & Commercial Lighting Equipment Section of the National Electrical Manufacturers Association.

—o—

**Paul N. Berner** has been named manager of home laundry equipment sales for the Norge Division, Borg-Warner Corp., Chicago. He formerly had been sales manager of Lovell Mfg. Co.

—o—

**Stanley C. Kolanowski** has been appointed chief radio engineer of Stewart-Warner Corp., Chicago. He joined the company's Radio Division 12 years ago.

—o—

**F. Howard Smith,** formerly assistant export sales manager, General Tire & Rubber Export Co., has joined the executive staff of General Tire & Rubber Co. of South Africa Ltd., which soon will open a plant at Port Elizabeth, South Africa.

—o—

Nichols Wire & Steel Co., Davenport, Iowa, announces the following changes in its organization: **G. V. Dryden,** formerly treasurer, has been elected chairman of the board of directors. He is succeeded as treasurer by **W. J. Johnston,** who has been assistant treasurer. **F. P. Leahey,** formerly general works manager, has been elected vice president of the company. Mr. Dryden, who has been with the company 23 years, has held during that time, at various periods, the position of secretary, treasurer, vice president, and president.

—o—

**Harry E. Sweet** has been appointed factory manager of Aircraft Screw Products Co., Long Island City, N. Y. He formerly was assistant factory manager of Aircooled Motors Corp.

—o—

For distinguished achievement in mining administration, **Eugene G. Grace,** chairman of the board, Bethlehem Steel Corp., Bethlehem, Pa., has been awarded the Charles F. Rand Gold Medal, by the Metals Divisions, American Institute of Mining & Metallurgical Engineers.

—o—

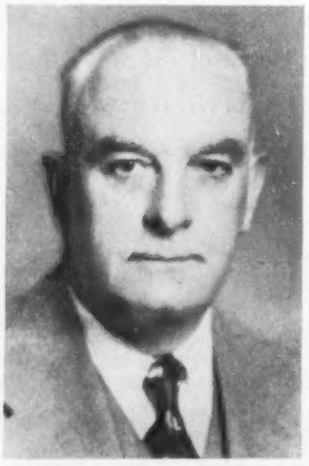
**Berchman A. Bannan,** vice president, Western Gear Works, Pacific Gear & Tool Works, San Francisco, and manager of the Southern California Division of Western Gear Works, has been awarded a special citation by the Bureau of Ships, U. S. Navy, for his wartime services as vice president of Western Gear Works, Lynwood plant.

—o—

**Dr. George W. Vinal,** chief of the electrochemistry section, National Bureau of Standards, has been awarded the Certificate of Commendation by the Bureau of Ships, U. S. Navy, for his outstanding service in development of new types of batteries and his work with the Joint Army-Navy Battery Advisory Committee, of which he was secretary.

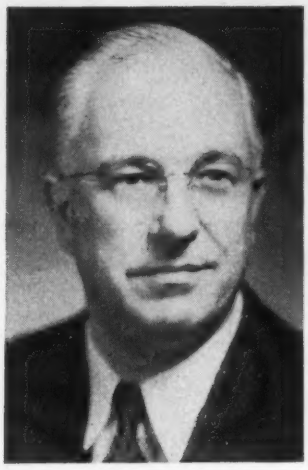
—o—

**C. G. Bensinger,** vice president and general factories manager, Glass Container Division, Owens-Illinois Glass Co., Toledo, O., has been appointed vice president and general manager of the Pacific Coast Division, with



WINTHROP B. EDWARDS

*Appointed manager, Yonkers, N. Y., plant of Otis Elevator Co., to be effective Dec. 1. Noted in STEEL, Oct. 20 issue, p. 80*



ERIC V. MURRAY
*Appointed assistant to general sales manager, Atlas Steels Ltd., Welland, Canada. Noted in STEEL, Oct. 13 issue, p. 78*

H. A. GEHRES
*Has been elected executive vice president, Cooper-Bessemer Corp., Mt. Vernon, O. Noted in STEEL, Oct. 20 issue, p. 84*

RALPH L. BOYER
*Named vice president and chief engineer, Cooper-Bessemer Corp., Mt. Vernon, O. Noted in STEEL, Oct. 20 issue, p. 84*

headquarters in San Francisco. **Kenneth C. White,** sales promotion manager, Glass Container Division, has been named general sales manager of the Coast division.

—o—

Micromatic Hone Corp., Detroit, announces the appointment of **Patsy Qualtieri** as district manager of its Los Angeles office.

—o—

Peninsular Grinding Wheel Co., Detroit, announces election of **Ralph H. Lundberg** as a vice president. He will be in charge of rehabilitation of the company's recently acquired vitrified wheel plant. He has been connected with the engineering staff of Norton Co., Worcester, Mass.

—o—

**R. G. Sault,** vice president of Porter Forge & Furnace Inc., Somerville, Mass., has been elected president of the Metal Treating Institute. Other officers elected were: Vice president, **Rowland H. Starr,** Starr Heat Treating Co., Detroit; treasurer, **R. W. Thorne,** Bennet Steel Treating Co., Newark, N. J.; executive secretary, **S. N. Clarkson.** Trustees elected were **Fred Heinzelman Jr.,** Fred Heinzelman & Sons, New York; **Charles H. Hewitt,** Dayton Forging & Heat Treating Co., Dayton, O.; and **Paul J. Seitz,** Commercial Steel Treating Co., Cleveland.

—o—

**W. E. Madden** has been appointed sales and division manager, Conveyor Division, of George Haiss Mfg. Co., New York, subsidiary of Pettibone Mulliken Corp., Chicago.

—o—

Chromium Corp. of America, New York, has elected **Frank J. O'Brien,** president, **Donald H. Bissell,** vice president, secretary and director, **George H. Sayers,** treasurer, and **Charles H. Belvin,** assistant secretary.

## OBITUARIES

**B. Frank Courtright,** 63, vice president and manager of sales, Wisconsin Steel Co., Chicago, division of International Harvester Co., died suddenly Oct. 17 in that city. He had been connected with the company since 1909.

—o—

**Alphonse E. Thiffault,** 70, chairman, Caspers Tin Plate Co., and a director of the Lafayette Steel Corp. and the Metal Lithographing & Coating Corp., all of Chicago, died Oct. 18 in that city.

—o—

**Arthur L. Smith,** 64, chief electrician, Ohio & Western Pennsylvania Dock Co. and Lower Lakes Dock Co., Ashtabula Harbor, O., subsidiaries of the M. A. Hanna Co., Cleveland, died Oct. 16. Mr. Smith had been connected with the Hanna interests for 38 years.

—o—

**Paul Pleiss,** 59, retired official of the Budd Co., Philadelphia, and of many of the company subsidiaries abroad, died Oct. 17 at his home in New York. He retired from business in 1938, but maintained his connection with the Pressed Steel Co. Ltd. in England, which he organized in 1926.

—o—

**Walter K. Stehman,** 56, former auditor and assistant comptroller of Crucible Steel Co. of America, New York, died recently.

—o—

**E. W. Hopkins,** 81, who retired in 1930 as Gogebic range manager at Ironwood, Mich., for Oglebay, Norton & Co., Cleveland, died Oct. 17 at his winter home at New Smyrna Beach, Fla.

—o—

**Howard H. Barrows,** formerly associated with General Electric Co. in Oakland, Cal., died Oct. 12 in Oakland. Until his retirement a year ago, he was manager of the lamp works of General Electric at Oakland.

**Paul Guercken,** 75, retired European vice president of Westinghouse Electric International Co., New York, died recently.

—o—

**George L. Conklin,** 58, purchasing director of the Sterling Engine Co., Buffalo, died recently in that city.

—o—

**John F. Cangemi,** 44, consultant engineer to the International Harvester Co., Chicago, died Oct. 16 in that city.

—o—

**William Doll,** 53, assistant sales manager, Burke Steel Co. Inc., Rochester, N. Y., died at his home there Oct. 15. He had been associated with the company for nearly 40 years.

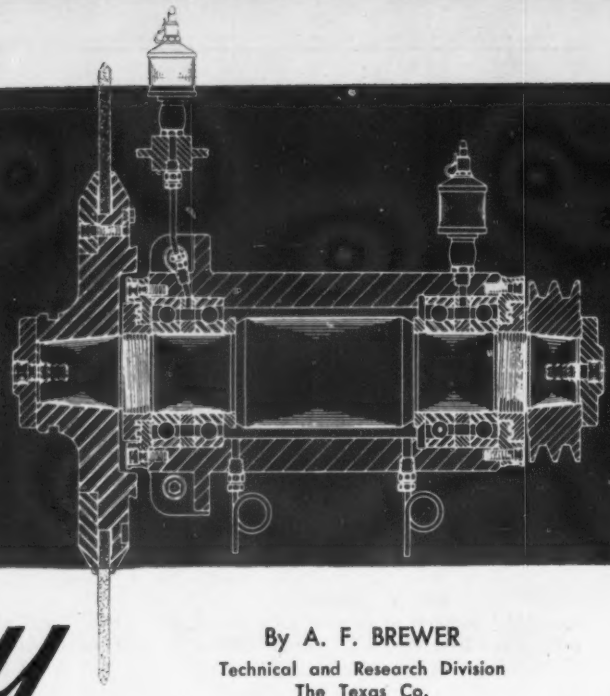
—o—

**Eugene M. Langley,** founder and manager of the Langley Pattern Co., Rochester, died Oct. 15.

—o—

**Stephen J. Flaherty,** traffic manager, Babcock & Wilcox Co., New York, died recently at his home in Elizabeth, N. J.

# LUBRICATION OF *Grinding Machinery*



By A. F. BREWER
Technical and Research Division
The Texas Co.
New York

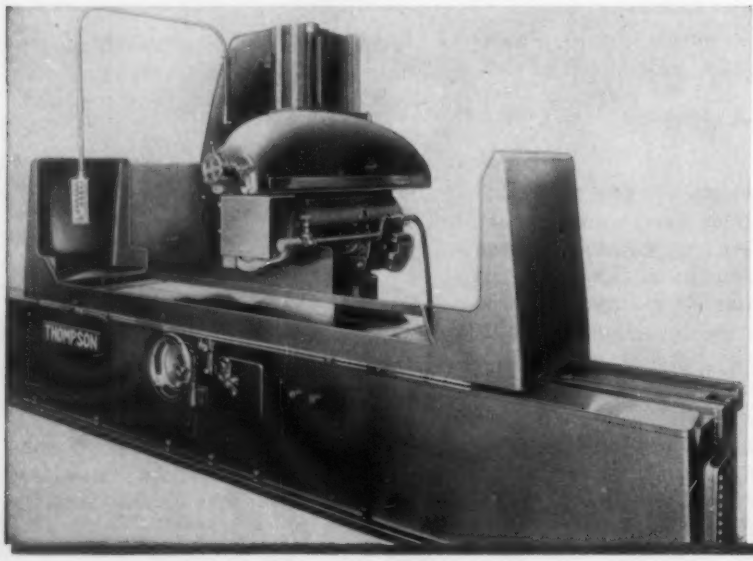
*Effective lubrication of the grinding machine spindle and other parts contributes materially to co-ordination of speed and precision required in modern grinding operations. This article describes some of the lubricating systems used and delves into the selection of lubricants*

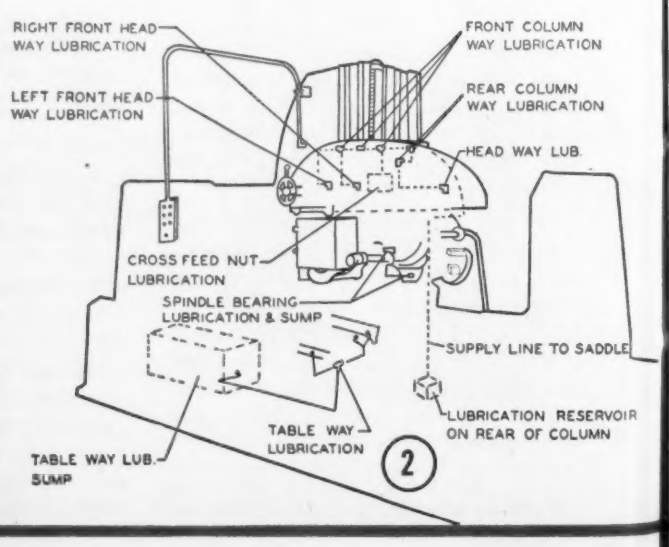
GRINDING, honing, lapping and super-finishing of machine parts serves to smooth down those microscopic high spots which would otherwise require flattening in service at the expense of power consumption, loss of productive efficiency and the imposing of an undue load on the lubricant used.

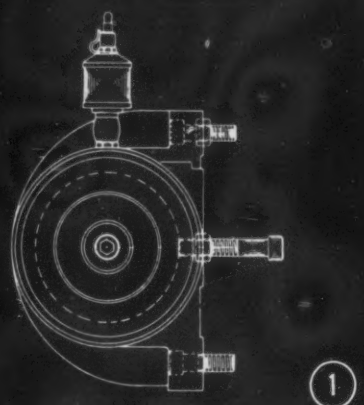
In consequence the modern grinding machine is designed for extremely high peripheral speed of the abrasive wheel. Due to this speed and the potential possibility of an appreciable temperature rise at all points of minimum clearance in the bearings where the lubricating films will normally be under considerable pressure, grinding machine lubrication must be carefully studied. An insufficient oil film at any such points might readily lead to impaired lubrication, subsequent wear of the contact surfaces, reduced production and ultimately the need for certain parts replacement.

As higher speeds are encountered, the procedure of lubricating by means of more fluid or lighter viscosity lubricants is generally followed in order to reduce drag, loss of power and to prevent increase in film temperatures due to internal friction between the component molecules of the lubricant.

It is general practice to vary the viscosity or lubricant body inversely with the speed. The reason for this is that the higher the speed the greater the degree to which the lubricant will be drawn into the clearance spaces by hydraulic pumping action. Where speeds are low and loads are more severe a still





RIGHT FRONT HEAD WAY LUBRICATION
LEFT FRONT HEAD WAY LUBRICATION
FRONT COLUMN WAY LUBRICATION
REAR COLUMN WAY LUBRICATION
HEAD WAY LUB.
CROSS FEED NUT LUBRICATION
SPINDLE BEARING LUBRICATION & SUMP
SUPPLY LINE TO SADDLE
LUBRICATION RESERVOIR ON REAR OF COLUMN
TABLE WAY LUBRICATION
TABLE WAY LUB. SUMP
2



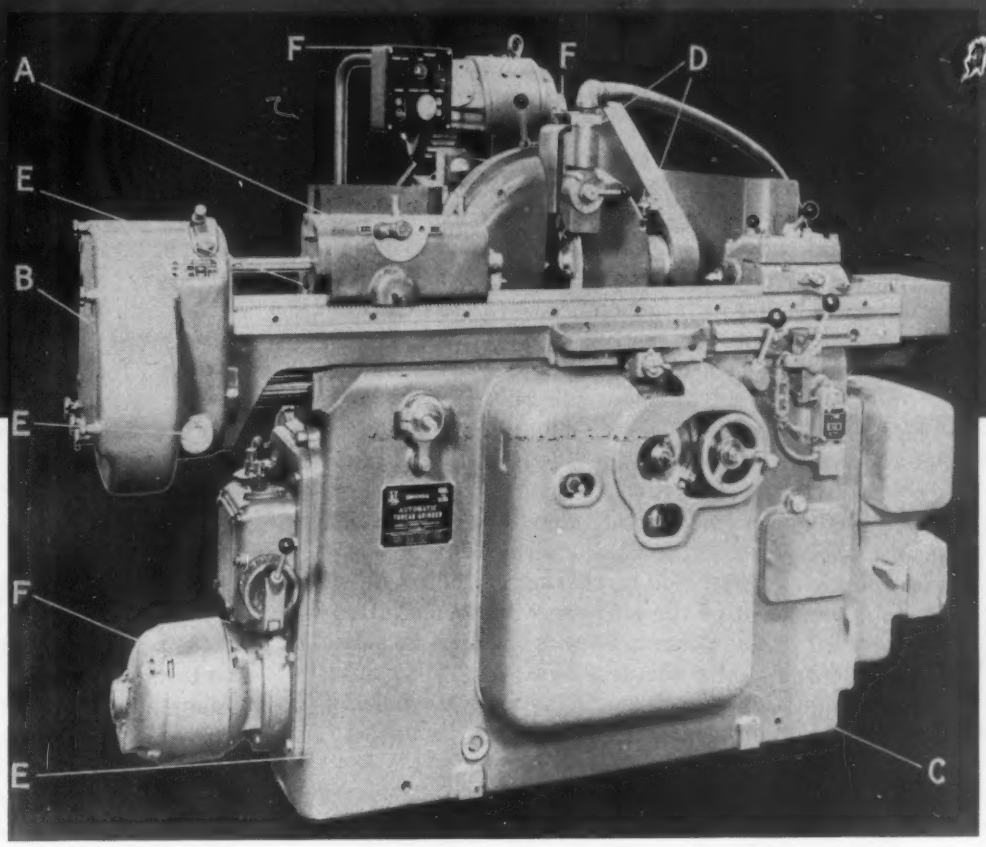



*Fig. 1 — Lubrication chart for a Jones & Lamson automatic thread grinding machine. A is the headstock and B the change gear housing, both of which require a high grade heavy-medium machine oil. Spindle oilers D require a high quality 150 SSU viscosity (at 100°F) spindle oil. E indicates sight gages which should be checked daily. F are motor bearings, checked monthly. (Above) Assembly of 20-inch wheel spindle, ball bearing mounted*

heavier lubricant may be required.

Rate of shear between the component molecules which make up the lubricating film is of importance as it is increased with increase in speed—conversely, it is decreased with decrease in viscosity. So, while the rotating shaft develops greater pumping action and a lubricating film of more uniform thickness as the center of the shaft approaches the center of the bearing, the increase in shear will result in an increase in internal friction within the lubricant itself, unless the body or viscosity of the latter is reduced accordingly.

Nature or smoothness of the contact surfaces is also a factor. When running steel-on-steel as in the ball or roller bearing, research has proved that the more highly finished the surfaces, the more dependably can low viscosity oils be used in a properly sealed bearing housing. In the sleeve-type bearing, however, the steel shaft should not be too highly finished, as microscopic depressions should still exist to serve as reservoirs for lubricant. It has been found that from 5 to 10 microinches thickness of lubricating film are advisable for higher peripheral speeds.

Development of a constant film of lubricant within a bearing clearance space, however, will be contingent upon the extent to which automatic lubrication is maintained. If oil is delivered by means of a drip feed oiler, wherein the principle is to supply just enough oil to maintain lubrication, increase in speed may cause impaired lubrication unless the rate of drip of oil is increased.

Where automatic lubrication of the force feed type is involved, there will often be more oil delivered than is required to maintain lubrication, i.e., flood lubrication, which will offset the effects of pressure. This is

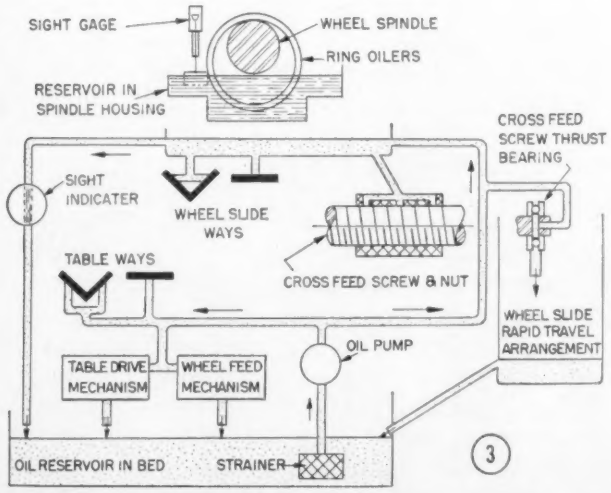



*Fig. 2—Automatic lubrication system, right, of the heavy duty precision hydraulic grinder, left, made by Thompson Grinder Co.*

*Fig. 3—Schematic diagram of the Brown & Sharpe lubricating system for plain grinding machines No. 20, 22 and 23, showing oil circulation*

definitely advantageous in some grinding machines, where flood lubrication of the spindle has been proved to be an adjunct to positive development of speeds as high as 50,000 revolutions per minute.

Flood lubrication also is beneficial in that the excess oil passing through the bearings will remove a certain amount of the heat developed during operation, or received from an external source.

Grease is also applicable to high speed grinding machinery. When a bearing is properly designed to retain the lubricant, and a grease chosen which has a high degree of protective ability, it will insure lubrication for an extensive period of operation, with the necessity for renewal perhaps only three to four times a year. Some ball bearings are designed and sealed so that the initial charge of grease lasts indefinitely.

Any such bearings in service should never be completely filled with lubricant, for this may not only lead to overheating or channelling of the product, but also to increased power consumption, due to the drag which may be imposed upon the rolling elements.

Lubrication of antifriction bearings is but a detail from the viewpoint of the amount of labor and attention involved. The important point is the original selection of the lubricant to be used,and the consideration of its characteristics as required by the principles of antifriction bearing construction and operation.

The purpose of lubrication is to facilitate as easy rolling as possible. To do this, all the surfaces (which are highly finished) must be in as perfect condition as practicable. The lubricant must, therefore, serve the dual purpose of lubricating and protecting these surfaces against rusting, corrosion, pitting, or abnormal wear.

The speed at which the modern grinding machine will operate depends upon the type of work to be performed, the amount of stock to be removed by grinding, and the nature of the materials involved.

Accuracy and rigidity are features of the grinding machine when it is first put into service. They are the result of the co-operative efforts of the machine designer and tool builder. The continued maintenance of this accuracy and rigidity, however, is a problem for the operating engineer and lubricating specialist.

Grinding machine spindles are driven by belt connection or an electric motor. The latter permits good flexibility in machine operation, reduces vibration and often enables very economical transmission of power. In machines of the latest type the motor is mounted directly on the wheel slide and belt-connected to the wheel spindle. In such design the motor armature virtually becomes the main shaft.

Idler and main drive shaft are very important elements in such machinery. They have, therefore, received careful study relative to the adaptability of the ball or roller bearing as a means of insuring most effective operation. The main drive shaft is, in fact, the salient factor in the maintenance of effective operation of the wheel spindle. On the other hand, this spindle is regarded as the most important member from the viewpoint of lubrication by virtue of its size, the heavy duty to which it is subjected, and the high speeds which frequently prevail.

Low clearance is an aid to proper functioning of such bearings; the occurrence of any play between the component parts would tend to set up a certain amount of pounding which would be detrimental to effective operation. In ball bearings (*Please turn to Page* 95)

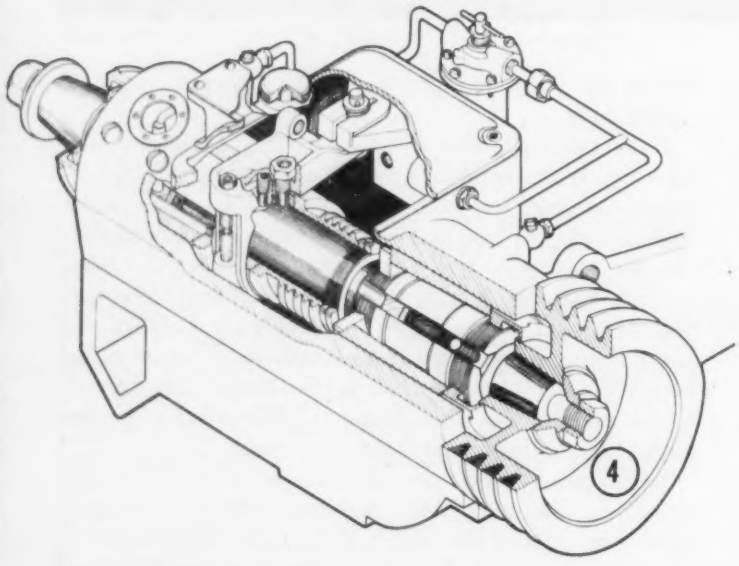



*Fig. 4 — Details of Norton wheel spindle. In the center of this design is a section indicated by solid black. In this area is set the spindle lubricating pump*

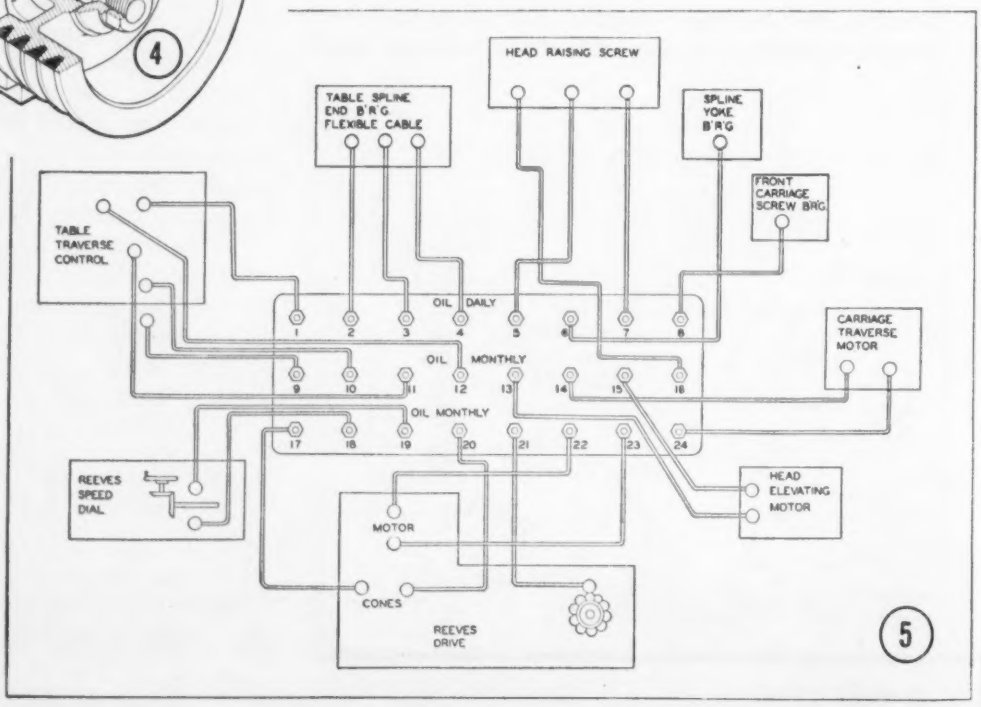



*Fig. 5—Lubrication diagram for a No. 36 rotary surface grinder made by Hanchett Mfg. Co.*

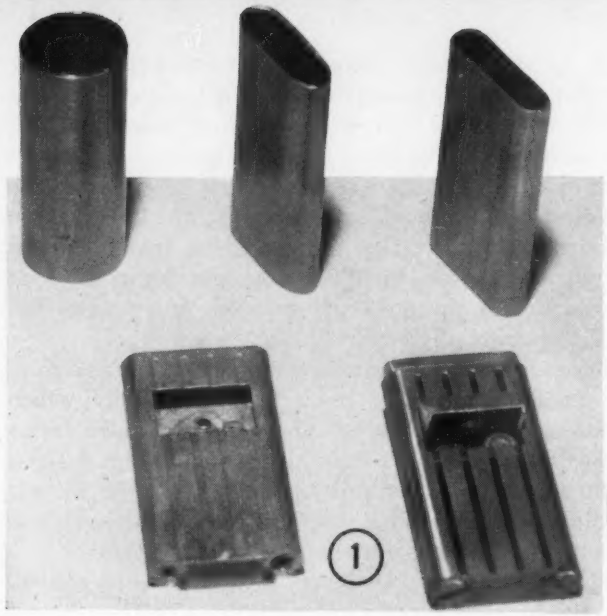


*Fig. 1—Original tubing, ovalized, struck, partly assembled and complete lighter with flap opened*

*Fig. 2—Ovalizing operation on cut tubing. Press action is controlled carefully. Too much pressure leads to die galling*

*Fig. 3—Ovalized case in press about to be struck*

# LIGHTER MAKING

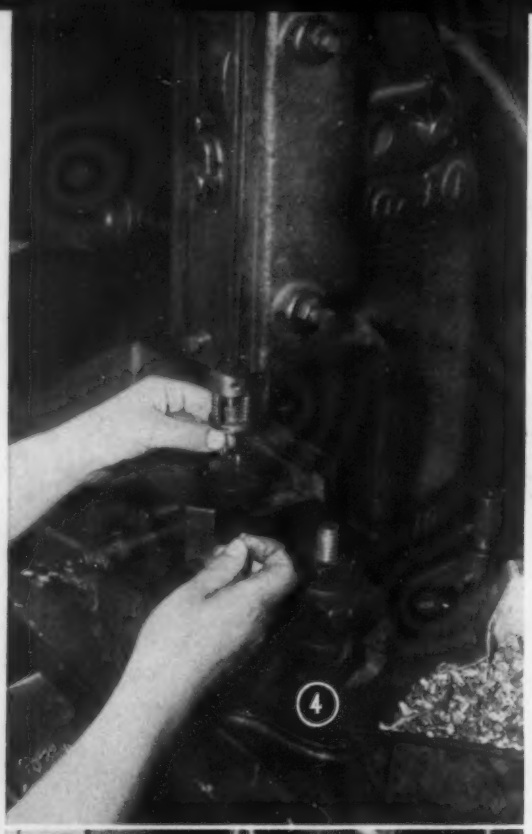
## *Involves Many Metalworking Procedures*

ONE hundred fifty-six operations—operations that include welding, heat treating, soldering and several special press actions are required to manufacture a new unconventional, wafer-thin cigarette lighter by the Colby Lighter Co., Mount Vernon, N. Y. Unconventional in its side opening door feature, the unit measures 2¼-inches long, 1-⅛-inches wide and ⅜-inch thick, and consists of 36 precision-made parts including its Monel shell.

Both welding and finishing of the tube for the shell are done to such close tolerances that it is difficult to decide whether the lighter case is of seamless or welded tubing. Strip used for the shell is 0.032-inch thick and is furnished to Colby by Superior Tube Co., Norristown, Pa., in the form of tubing welded by the Weldrawn process.

Thin shape of the case is obtained by two "tailored" press operations referred to as "ovalizing" and "striking" operations. The tubing as received by the plant is cut off, deburred and ovalized as shown in Fig. 2. This is primarily a "squashing" operation to start formation of the oval shape, and output is about 500 pieces per hour. Fig. 1 illustrates original tubing, its shape after ovalizing and being struck, in addition to the partly assembled and completed lighter with door opened.

Striking operation which follows ovalizing is done on a press that strikes a 75-ton blow. Die used with this press performs three missions. Besides giving the



case its final thin shape, it forms keyways for register of the top plunger shell mounting and stamps a paneled design—all in the same blow. The die can be seen in Fig. 3 which also shows an ovalized case in the press about to be struck. Because of die cleaning after each blow, use of an air-operated mandrel and lubrication of the shells, this operation output is reduced to 200 pieces per hour. A door pierce follows the striking operation and readies the shell for assembly.

Brass and stainless steel go into the manufacture of the inside parts. The brass inner assembly which positions wick, flint wheel and flint tube, also forms top of the fuel tank within the shell. In Fig. 6 these components are shown being removed from an annealing furnace after a 1300° F heat treat, which is followed by various finishing press operations.

Fig. 4 shows the swaging that is done in attaching the brass plunger shell mountings to the plunger sleeves before insertion of the assembly into keyed recesses of the shell. These mountings carry springs and pins which afford the spring action to the automatic plunger operation of the lighter.

Monel strip of various gages is used for the door, bottom plate and top plunger shell. The strip is blanked, drawn, formed and pierced as required by various parts. Fig. 5 illustrates forming operation performed on the door blanks. Forming is followed by a 10-minute anneal at 1600° F and a strike operation which irons out the door to its final shape.

Inspection of flint wheels, made by an outside supplier, is rigid to assure satisfactory lighter service. An optical comparator giving 50 x magnification is used in this inspection to assure proper tooth contour and evenness of tooth depth throughout the circumference of the wheel. Steel springs and miscellaneous small parts are supplied by outside manufacturers.

In assembly, all fixed inside parts are soldered to the shell and checked for proper position. The shell is then sent to the polishing department for surface preparation of emerying and buffing and returned for final assembly. In the final assembly the doors are mounted and attached to the plunger assembly, cotton, wick, flint and fuel and flint screws are added, and the completed lighter is given a "touch-up" polish.

*Fig. 4—Swaging spring plunger assembly. Materials are brass strip and 0.080-inch Monel tubing*

*Fig. 5 — Press operation on door assembly. Part is first blanked, then given ¾-inch draw as shown here. Flat blanks are shown under operator's hand, and a part is being removed from under machine after being drawn. Material is covered with drawing compound to facilitate operation*

*Fig. 6—Assembled parts being withdrawn from annealing furnace*

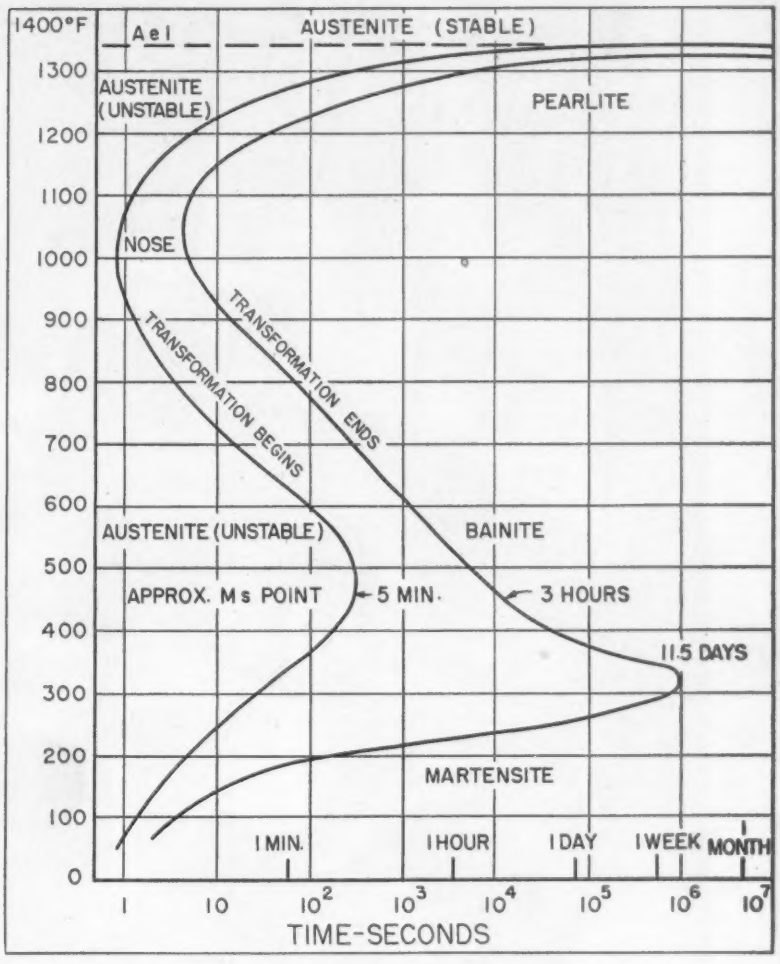
# INTERRUPTED QUENCHING

## *as a metallurgical tool*

*Techniques and equipment used in austempering, isothermal quenching and martempering are discussed by the author. All three of these treatments use heated salt pots operating at normal drawing temperature ranges and require facilities for rapid heat dissipation*

By C. H. LEKBERG

*Supervisor, Industrial Gas Engineering*
Northern Indiana Public Service Co.
Hammond, Ind.




*S-curve diagram, 0.89 per cent carbon steel*

IT is well recognized that heat treating steel is a function of time and temperature. In other words, the results depend upon two variables. In order to determine the contribution of each variable, it is necessary to eliminate one of these influences as a variable. In about 1929 studies were started on this problem at the research laboratory of United States Steel Corp.

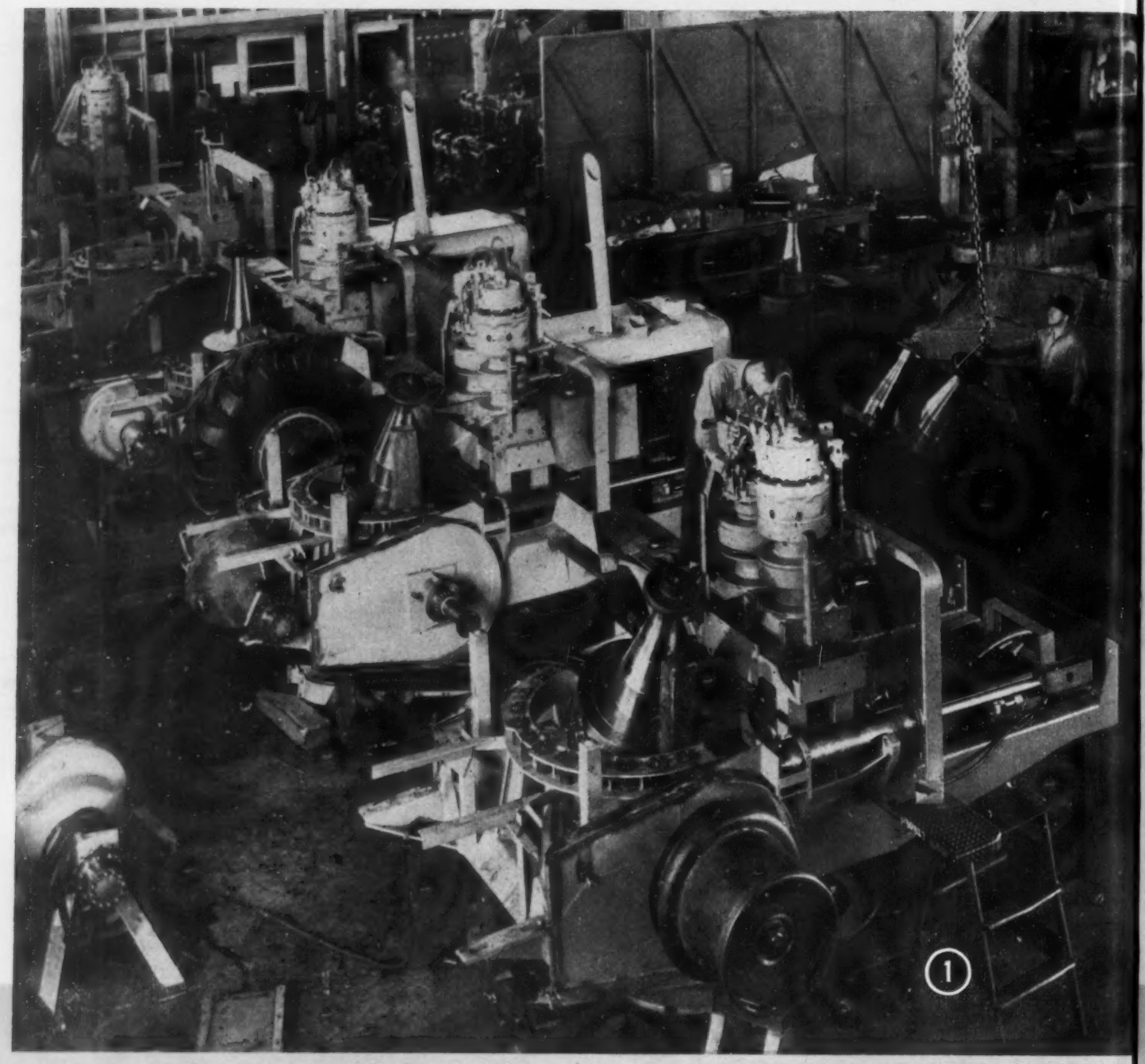
They decided, quite logically, to perform their tests under constant temperature conditions (isothermal), leaving only the time factor as a variable. The method employed was briefly as follows:

Several small pieces of a certain steel were heated to a temperature sufficiently above the upper critical range to insure complete transformation into austenite. These pieces were then quenched in a salt bath, held at a predetermined temperature below the equilibrium transformation temperature. Throughout the test, bath was maintained at this temperature, and at intervals one piece was removed and quenched in water. These pieces were examined metallurgically and it was noted that after the steel had remained in the bath a certain length of time, the original austenite began to transform into other constituents. By progressively removing the remaining pieces at predetermined intervals, the progress of this transformation was noted until it was found that no further transformation took place.

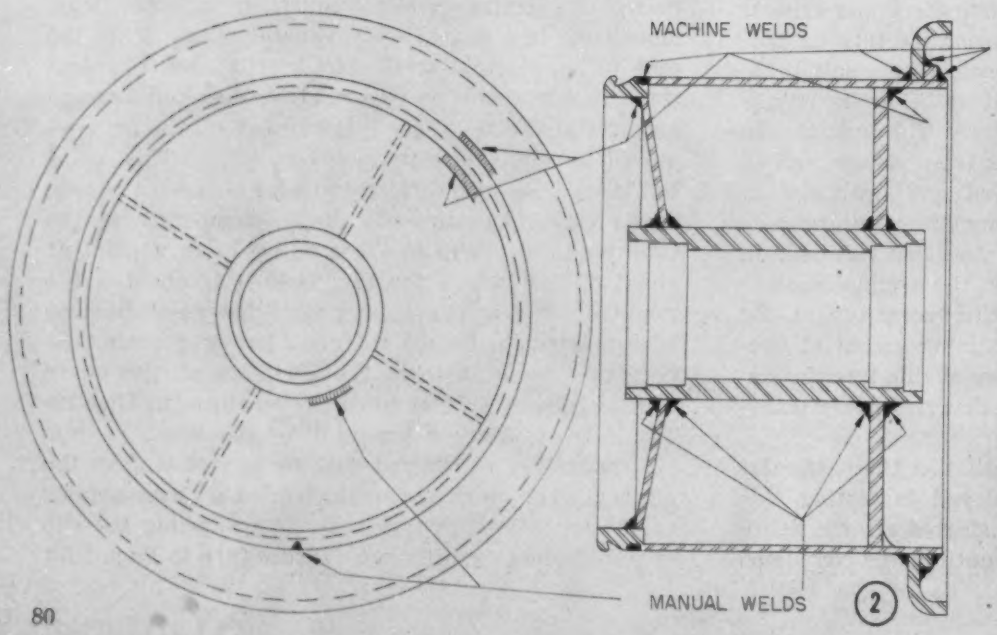
This test established the fact that at the particular quench bath temperature, employed in testing this particular steel, transformation started after a definite time interval and progressed until it was completed after a second time interval. By repeated tests at other temperatures, it was possible to get enough information to plot two curves for this steel on a time temperature basis, one curve showing when transformation began and the other showing when it ended as shown on accompanying S curve diagram. Curves were plotted against a vertical ordinate, showing temperatures on a uniform scale, and a horizontal ordinate, showing time on a logarithmic scale.

At the higher quench bath temperatures, time required for transformation to begin is quite long, amounting to 1 day at approximately 1335° F, in the case of a eutectoid steel. At lower quench temperatures time required is progressively less until at approximately 1025° F, for this same steel, the time required is slightly less than 1 second. This point (which varies with different steels) is called the nose of the curve. At still lower quench temperatures, the time required starts to increase again to a point at about 450° F where for this steel it is about 5 1/4 minutes. This is the approximate Ms point because here martensite begins to form. Lower quench temperatures again reverse the direction of the curve toward the left until at room temperature the time required is again about 1 second for this steel.

It is readily recognized that these trends gave the curve for the start of transformation a shape similar to the letter "s". The second curve, showing the end of transformation, although (*Please turn to Page* 107)



1




2

*Shipbuilder's secret of subassemblies, joined in the final assembly by welding, is exploited to the limit on the production line of a California scraper builder*

# MECHANIZED Welding and Cutting

## Employed in Fabricating Heavy-Duty Earth Movers

By EARL GRIFFETH
*Plant Superintendent*
Wooldridge Mfg. Co.
Sunnyvale, Calif.

EARTH-MOVING equipment must operate under varied conditions, and must be constructed to operate efficiently at all times. Hard or frozen ground, or ground containing large rocks or partially decomposed granite are a few conditions that call for sturdy construction.

In fabricating its line of heavy duty earth-moving equipment to meet such conditions, Wooldridge Mfg. Co., Sunnyvale, Calif., employs to the limit the shipbuilder's secret of welded subassemblies, joined by welding in the final assembly. This involves extensive use of mechanized welding and cutting, along with adequate jigs and fixtures required for maximum efficiency in the welding operations.

Joining operations in the plant embrace both the Unionmelt electric welding process and manual arc welding. The former is used mostly in the fabrication of subassemblies while the latter is used to join the subassemblies in making completed units.

For cutting small parts and trimming for fit-up, the company uses manual oxyacetylene torches; however, mechanized cutting, Fig. 3, is employed in forming virtually dozens of different pieces for fabricating into subassemblies. Two oxyacetylene shape-cutting machines and 15 of the portable types are used in this work. With these, and a number of hand-cutting blow-

*Fig. 1—Tractor unit assembly line*

*Fig. 2—Location of manual welds in the wheels*

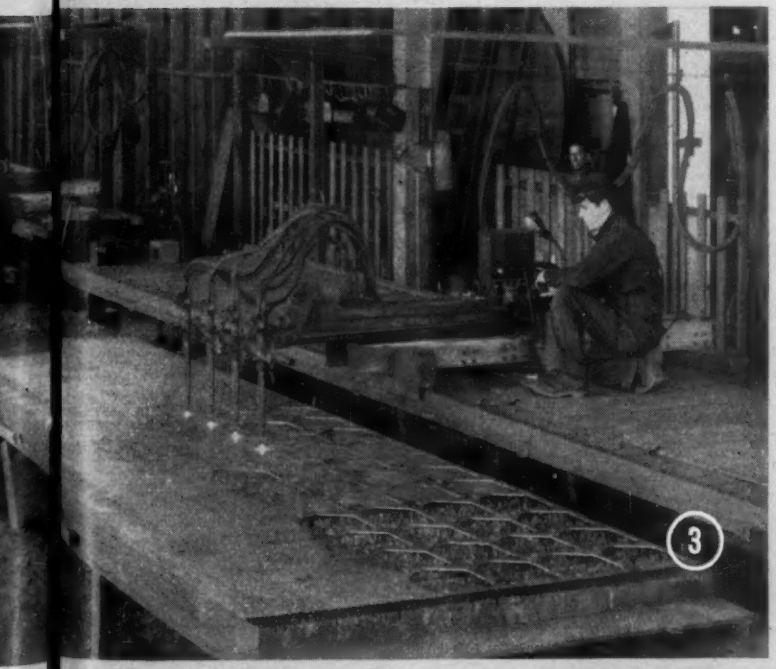
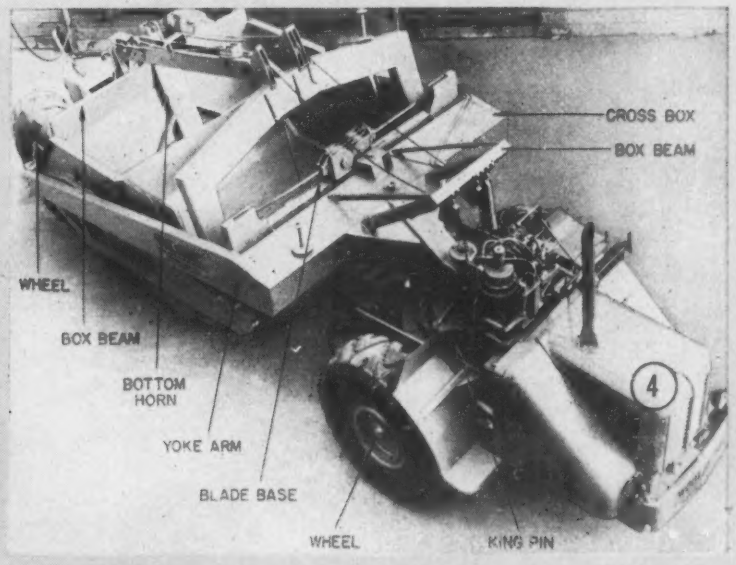



*Fig. 3—Mechanized cutting method employed in forming virtually dozens of different shapes for subassembly fabrication*

*Fig. 4—"Star" of the company's line, the Terra Cobra, self-loading, 18-yd capacity scraper*



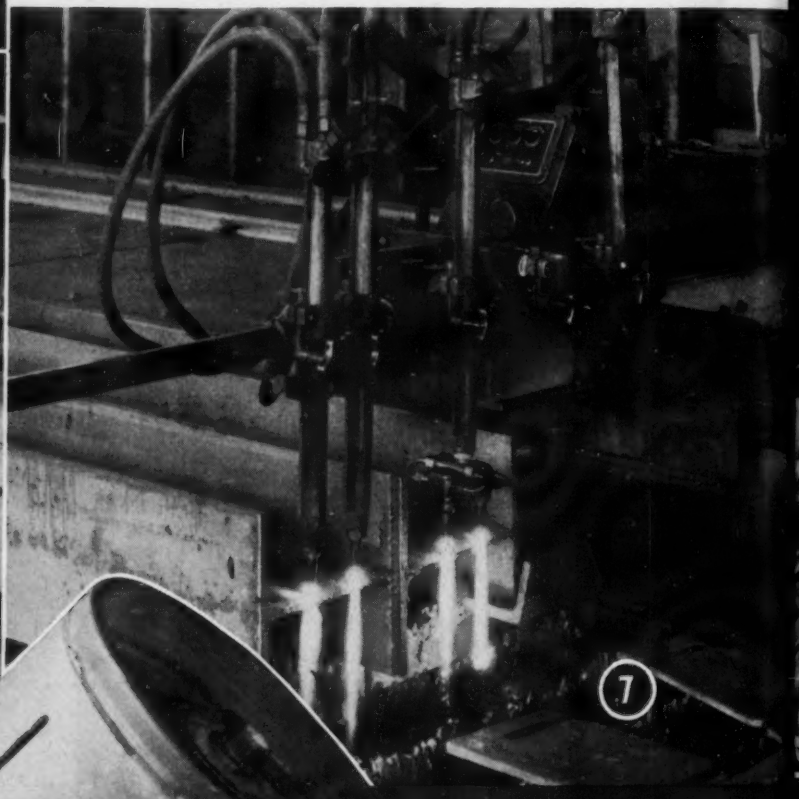


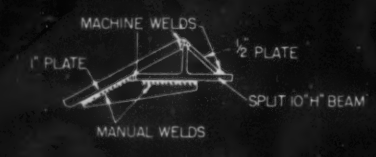
pipes, a burning crew of 29 men, including a shear man and two shear helpers, process 25 tons of steel sheet and shapes per 8-hour shift from stockpile to storage ready for assembly. Only about 15 per cent of the steel processed is scrap material.

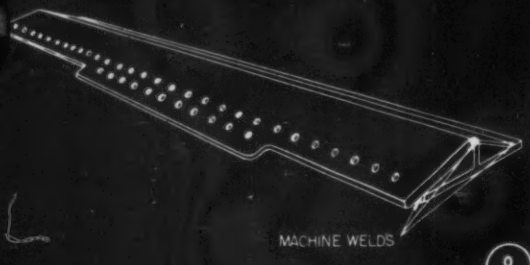
Following the fabrication procedure of typical sub-assemblies will best illustrate how mechanized welding and cutting are used in the manufacture of these huge earth movers.

Fig. 4 shows the "star" of the company's line. It is the Terra Cobra scraper, a self-loading unit that carries 18 yards of material for long distances at a speed of 21 mph, and spreads it at the point of discharge. Some 15 tons of steel are used in the manufacture of this unit, and about 1500 manhours are required for processing the steel. Each scraper requires about 1352.6 linear feet of oxyacetylene cutting, 1054.8 linear feet of manual arc welding and 327.6 linear feet of automatic electric arc welding.

The illustration points out some of the parts that are produced by the methods mentioned above. The tractor-unit frame assembly of the scraper is a good



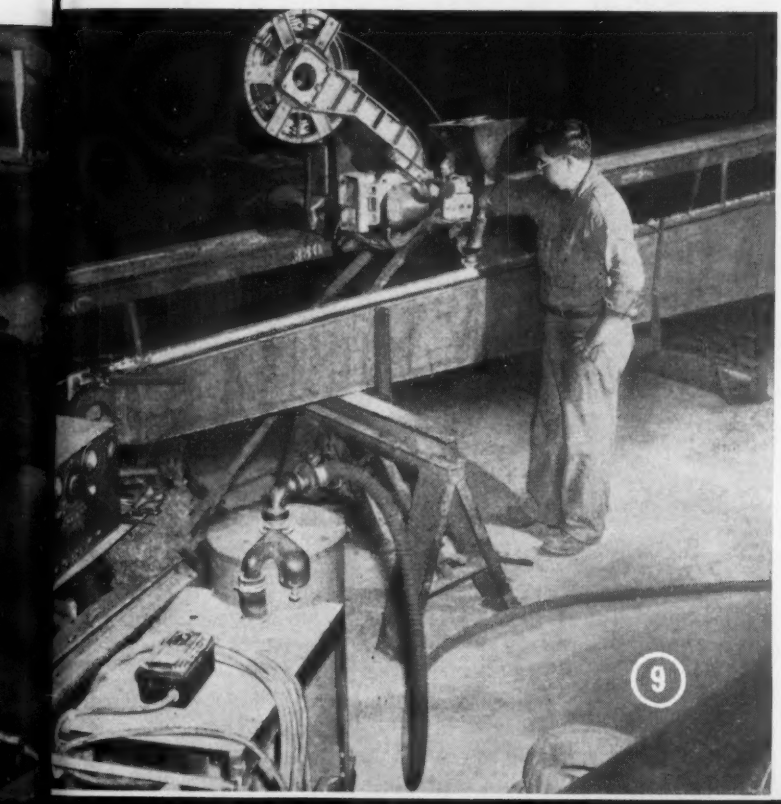


example of a great many simple fabricated subassemblies welded into one rigid complex unit. It can be seen along with some of the auxiliaries in place in Fig. 1, which is a view of the tractor unit assembly line.

Main drive wheels for the scraper are made to accommodate a 21.00 x 24 tire. They are so nearly complete after welding that the only finishing required is the boring of the hub for bearing cups, and drilling of the flange for the sprocket gear. Incidentally, the company, in all, manufactures 24 different types of wheels from shape-cut steel plate. Location of welds in the wheels for the scraper is shown in Fig. 2. Tack welds are made manually, while the finish welding is done by the automatic electric welding process.

Actual wheel fabrication begins with the cutting of disks from 3/8-in. steel plate. This operation is performed with a CM-16 portable cutting machine. The same machine is then used for cutting out the center to form a steel ring as shown in Fig. 5. These particular disks are 23 5/8-in. diameter with an 8 1/4-in. diameter center hole.




Tire flanges are cut out two at a time on a CM-12 shape-cutting machine. Blanks are sent to the forge shop where they are pressed to shape. They then are returned to the shape-cutting machine for a final trimming to correct outside diameter.

Illustrated in Fig. 10 are the various flame-cut components that go into a welded wheel and the hub, and one of the subassemblies made from some of these components. In the left foreground is a tire flange, while in the right foreground is one of the wheel disks. A welded and machined flange ring base rests on the disk.

Fig. 11 shows the welding of the flange ring bases. The rings are formed from 1 x 2 1/2-in. flat bars that are first rolled to the desired diameter and a welding Vee prepared at the joint. The rings are then strung side by side over a copper chill bar. One manual weld pass ties the group into one piece and forms a backing for the final 2-pass automatic electric arc joining operation. The rings are then broken apart and machined to finished dimensions.

In trimming the hub subassembly, the hub is set over a cone centering device. Another cone is set on top to provide a table for the traction wheel which rotates the blowpipe. The drive unit itself is adapted from a portable cutting machine. Wheel and cutting blowpipe are mounted on a turntable so that the entire setup can be rotated at will, thus avoiding twisting of the oxygen and acetylene hoses.

*Fig. 5—View showing cutting operation in which wheel center is cut out to form steel ring*

*Fig. 6—Here, compressed air-operated Unionmelt welding head is mounted on an adjustable boom. Wheel is in welding positioner and is rotated under stationary head. In this operation, one man turns out 10 to 12 wheels per 8-hour shift*

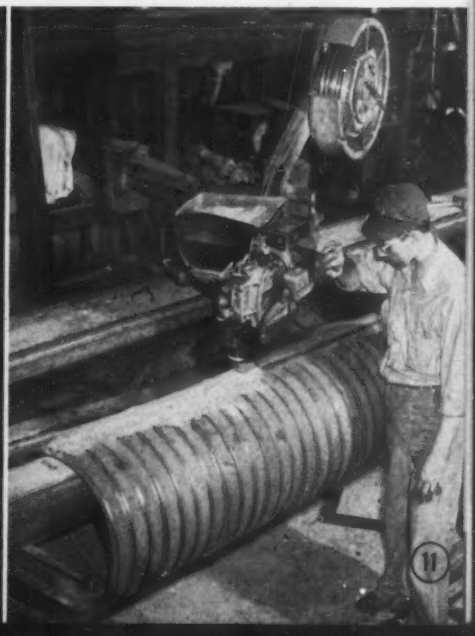
*Fig. 7—Beam-splitting operation. Note steel spacers which are dropped over beam to prevent warpage as cutting progresses*

*Fig. 8—Details of grader blade base*

*Fig. 9—Welding of yoke arms*

*Fig. 10—Various flame-cut components that go into welded wheel and hub. Left foreground, tire flange, right foreground, wheel disk. Welded and machined flange ring base rests on disk*

*Fig. 11—View showing welding of flange ring bases*



Another welding operation on the wheels is shown in Fig. 6. In this operation, a compressed air-operated Unionmelt welding head is mounted on an adjustable boom. The wheel itself is mounted in a welding positioner and is rotated under the stationary head. Amount of automatic welding varies with the wheel design. One man is capable of turning out 10 to 12 wheels per 8-hour shift with this installation.

The grader blade base makes use of flame-cut steel and welded fabrication. Fig. 8 shows the details of this member. It can be seen from the detail of the section that the blade base proper is made from 1-in. plate stiffened with a piece of 5/8-in. plate and a split 10-in. H-beam.

Beam-splitting operation is shown in Fig. 7. Directly to the right of the cutting flames are two spacers of steel plate. Several of these are dropped over the beam to prevent warpage as the cutting progresses. The beams are allowed to cool with the spacers in place. As in all shape-cutting operations at this plant, the machine is guided by a magnetic tracer.

In the actual welding of the blade base, the automatic welding head is mounted on a cutting-machine carriage and the melt is retained at the weld zone by an asbestos-lined wood retainer clamped to the steel plate. The blade base is suspended between two tripod supports by forks which are inserted into the ends of the base. Thus the work can be rotated and locked in position for making successive welds.

Advantage is taken of the natural weld distortion to produce the parabolic curve on the leading edge of blade base. Because this member is automatically welded, and the speed and current values are the same on successive bases, the distortion is also the same. This makes it necessary to set only about 1 out of 50 bases.

After the blade base is welded, the leading edge is beveled by a CM-30 portable straight-line cutting machine on the setup. The bevel is not straight but has a predetermined parabolic curve. The track bent to the necessary arc guides the machine in making this curve.

Pulling power of the engine is transmitted to the scraper by means of two yoke arms, one on each side. These are essentially box beams of 1/2-in. side plates, flame-cut to shape, and 1/4-in. flat bars. The arms are fabricated by welding each of the four corners. Fig. 9 shows the welding operation. In the left background are the motor-generator sets and in front of them is the welding head.

(*Please turn to Page* 111)

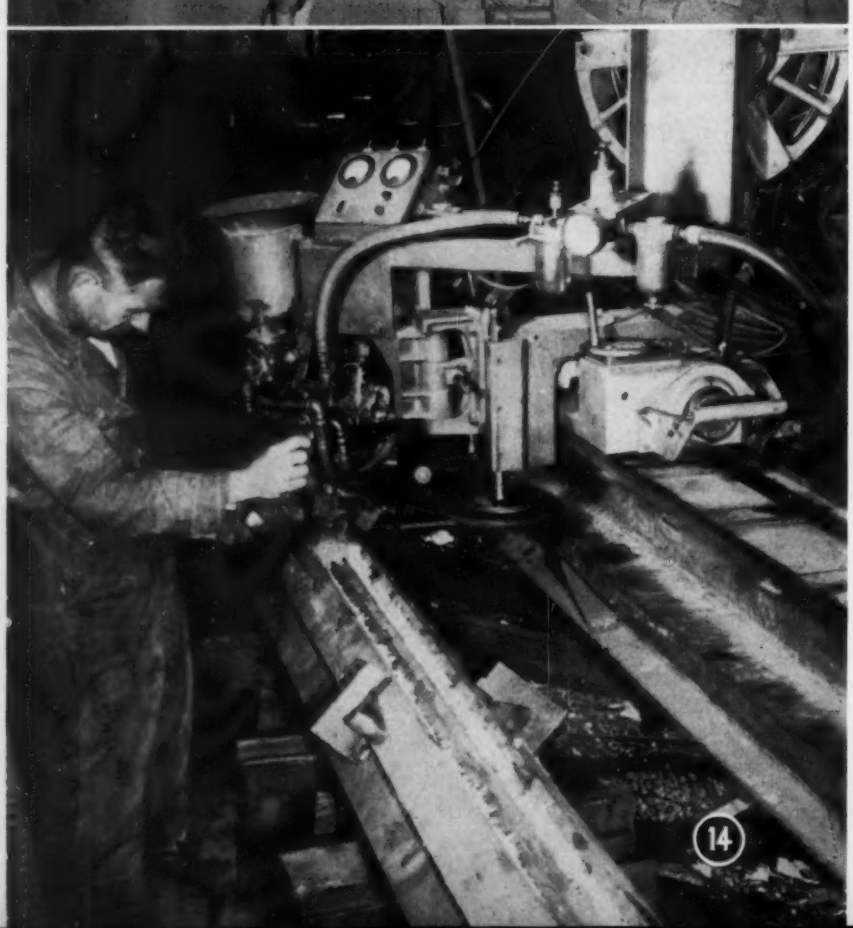


*Fig.* 12—*Fixture in which bearing ring and pin assembly is placed, then rotated*

*Fig.* 13—*In this jig, four subassemblies—two yoke arms, a head cross box beam and vertical hub—are assembled*

*Fig.* 14—*Box beam made from two angles by corner welds joining the legs. Note melt retainers of wood faced with asbestos rope. All photos courtesy The Linde Air Products Co.*



DETROIT 12, MICHIGAN
REPUBLIC 3000 TWINBROOK 2-3200 AVON 2230
TELETYPE NUMBERS: CHGO 1269 • DET 33 • CIN 64

New Phone . . . TWINBROOK 2-3200

New Address . . 13400 MT. ELLIOTT AVE.
DETROIT 12, MICHIGAN

# Central Steel

& WIRE COMPANY

OFFICES AND PLANTS

CHICAGO 80, ILL.
3000 West 51st Street
REPUBLIC 3000

DETROIT 12, MICH.
13400 Mt. Elliott Avenue
TWINBROOK 2-3200

CINCINNATI 16, OHIO
525 Township Avenue
AVON 2230

TELETYPE NUMBERS: CHGO 1269 • DET 33 • CIN 64

# Engineering News *at a Glance*

**STAINLESS MOVES UP:** Progress being made in widening use of stainless steel in the dairy industry—especially 18-8 chromium-nickel types—is revealed by a survey recently made by Allegheny-Ludlum Steel Corp. In 1933, about 30 per cent of all new milk processing equipment was made of stainless steels. By 1941 this percentage rose to 66.7 per cent, or two-thirds of the total. In the immediate postwar period, it is estimated that over 80 per cent of all new equipment coming in contact with milk in dairy plants will be of stainless.

**NO "FLASH-BACK":** Type of heating element incorporated in domestic gas furnaces now being built by Iron Fireman Mfg. Co., Cleveland, becomes highly radiant in absorbing the intense heat of the transparent gas flame. The burner includes horizontal gas ports in a stainless steel burner head which will not become oxidized and scaled, nor obstructed by any material falling on them. It also preheats air, thoroughly mixing it with the gas to give high combustion efficiency. "Flash-back," according to the company, is impossible in this burner.

**ELEVEN-UNIT WELDING "TEAM":** To speed up production of Quonset huts for civilian use, Sciaky Bros. Inc., Chicago, recently designed a special giant multiple-head spot welder that welds 88 spots almost simultaneously to form large curved joists. Under ideal conditions, production rate of the machine is better than one complete joist per minute. Welder, which is rated 1000 kilowatt-amperes, is capable of joining two thicknesses of 11-gage steel. Unusual feature of the machine is its division into 11 units, each being a complete machine in itself. Sixteen hydraulic welding cylinders, 8 transformers and a hydraulic motor are included in the machine.

**CURTAIN WALL:** For years designers held that the principle of the curtain might well be applied to multistory buildings—that a wall, in form of light, fabricated panels could be "hung" on the skeleton framework of a building, saving in cost and weight over the conventional thick, masonry walls. An experimental model of such a curtain wall, exhibited recently by one of the steel companies, consists of an outer surface of corrugated stainless steel. Basic unit of the wall is a square sandwich panel 4 feet 4 inches on a side, consisting of two sheets of steel with an insulating core between them. Weather side sheet is corrugated stainless. Resistant to moisture and ravages of weather, the stainless also helps provide strength that makes the 200-pound panel practical. Equivalent area of masonry weighs between 1400 and 2500 pounds.

**SIMULATES AIRCRAFT SPEEDS:** Machine now being built by the Navy subjects aircraft pilots and instruments to high accelerations, equivalent to those experienced when flying military aircraft. Powered by an electric drive system developed by General Electric engineers, it provides radial accelerations up to 1290 feet per second or 40 times the acceleration of gravity. Rotating system is driven directly by a vertical motor rated 4000 horsepower, and is capable of developing a maximum torque of 1,700,000 foot-pounds.

**MATHEMATICS LAB:** In Washington, it was learned, a federal center of applied mathematics, National Applied Mathematics Laboratories, was recently established as a division of National Bureau of Standards. Organized to conduct research and provide services in the field of applied mathematics, the new organization is oriented around modern mathematical statistics as applied to the physical and engineering sciences, and to the development and use of modern high speed computing. Four separate labs are included in the setup. These include: The Institute of Numerical Analysis, Computation, statistical engineering and machine development laboratories. Concept of such a center originated in 1946 in what is now the Office of Naval Research.

**UNVEILS TESTER:** Testing experts from both government and private industry attended recently the first demonstration of a new type of Baldwin-Tate-Emery testing machine at the plant of A. H. Emery Co., Stamford, Conn. Designed primarily for precision testing nonferrous metals, plastics, rubber, fibers and similar materials, the machine is one of four built for Monsanto Chemical Co., University of Minnesota, B. F. Goodrich Co., and the U. S. Bureau of Standards. Instead of using a hydraulic loading system, the machine uses a mechanical screw arrangement. Loading crosshead is driven by two screws that pass through nuts in the crosshead. The screws are rotated by a 1:1 or 10:1 gear transmission which is driven by a variable-speed motor. Speed of loading is steplessly variable from 0.05-inch to 20 inches per minute, and can be held constant within plus or minus 2 per cent.

**INTRICATE CABLE:** Essential accessories of the war-time airborne detector, now turned oil and mineral prospector, are the unique electrical wires and cables manufactured by the electrical cable division of American Steel & Wire Co., Worcester, Mass. Intricate as a watch in its manufacture, the cable is armored with round wire applied in two layers in opposite directions about the core, so that any tendency to twist is minimized. Cables of this type range from ⅛ up to ⅞-inch in diameter and carry from one to six electrical conductors. Strength of the steel armor is sufficient to support more than 20,000 feet of cable with a reasonable factor of safety.

**HIGH ALTITUDE TUBE:** In Brooklyn, N. Y., Amperex Electronic Corp. reveals existance of a vacuum tube design which is expected to take a leading role in control circuits of guided missiles being developed by the Air Forces. It is designed for use on high voltages at altitudes up to 60,000 feet. When used in areas which are strongly radioactive, the tube will not break down externally due to ionizing action.

**TOMORROW'S FUEL:** A rapid change in the use of fuels is at hand. Mostly it springs from revolutionary new things being done with coal. Some, probably most, of tomorrow's gasoline will come, again, via the breaking up and rearrangement of the gigantic molecules containing carbon, hydrogen and oxygen that comprise coal. Unless a sucessful coal-burning gas turbine materializes, *Westinghouse Engineer* predicts, trains some years hence may be pulled by gas-turbine locomotives requiring not coal, or water, or boilers or ash handling, but consuming liquid fuel that has been synthesized from coal.

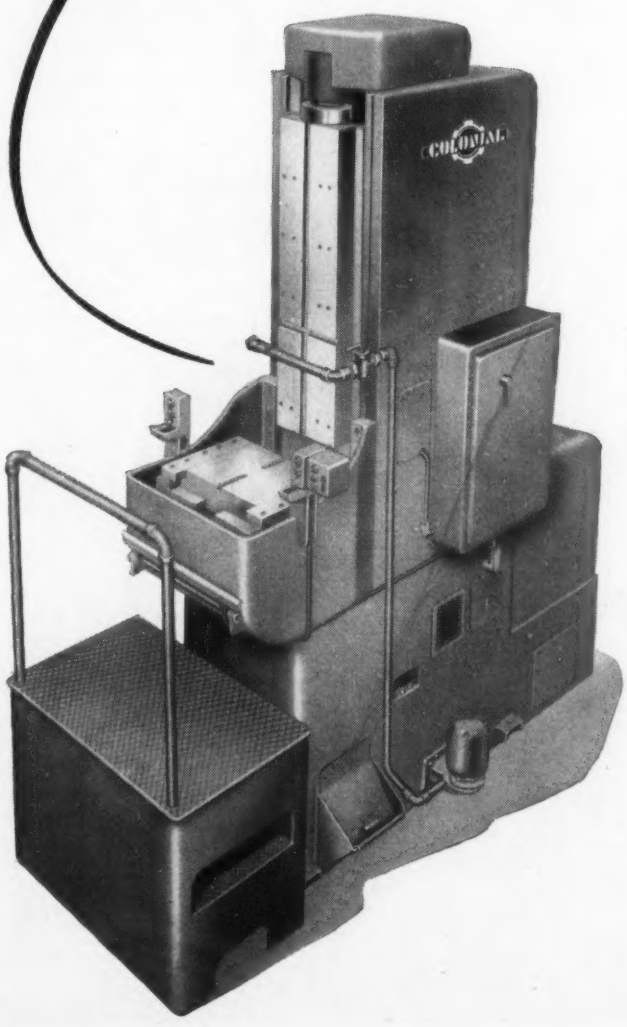
# Announcing

## A NEW LINE OF 10 & 5 TON

# SINGLE RAM PULL-DOWN AND PULL-UP

## BROACHING MACHINES

*Illustrated is the new 10 ton Single Ram surface broaching machine*




**HIGHER OUTPUT—**

Greater rigidity—higher return speeds.
New hydraulic system layout.
New cooling system for higher output rates.

**EASIER MAINTENANCE—**

Accessories can be serviced with the machine running.
Automatic lubrication with quick priming pump.
Panel mounted hydraulic and electric controls for quick inspection and adjustment.

**GREATER ACCURACY—**

Increased work accuracy—hardened and ground box type gibs.
Hardened and ground table ways.

**Plus all the well-known features which have made Colonials "tops" where accuracy, speed and low-cost-per-piece really count.**

*For complete information, ask for the current issue of Broaching News (Vol. 9, No. 3).*

**colonial BROACH COMPANY**
**DETROIT 13, U.S.A.**
*Broaches - Broaching Machines - Broaching Equipment*

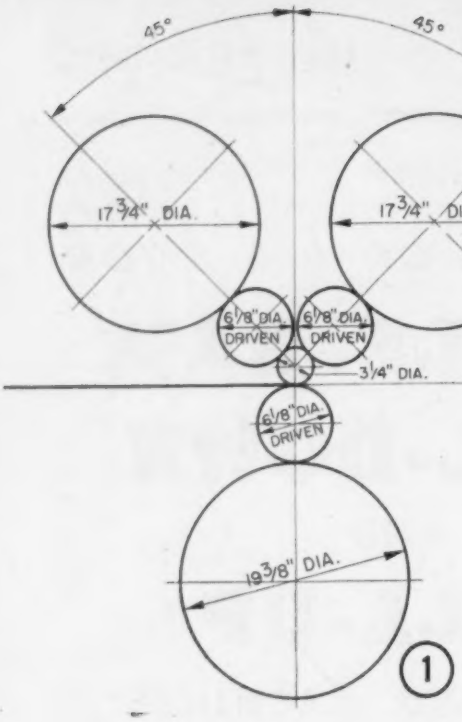



*Fig. 1—Roll layout of a 20-inch reversing cold strip mill*

*Fig. 2—Complete Montgomery-type 20-inch cold strip mill installed in a Detroit plant*

## Small Diameter Work Rolls Feature

# MONTGOMERY COLD STRIP MILL

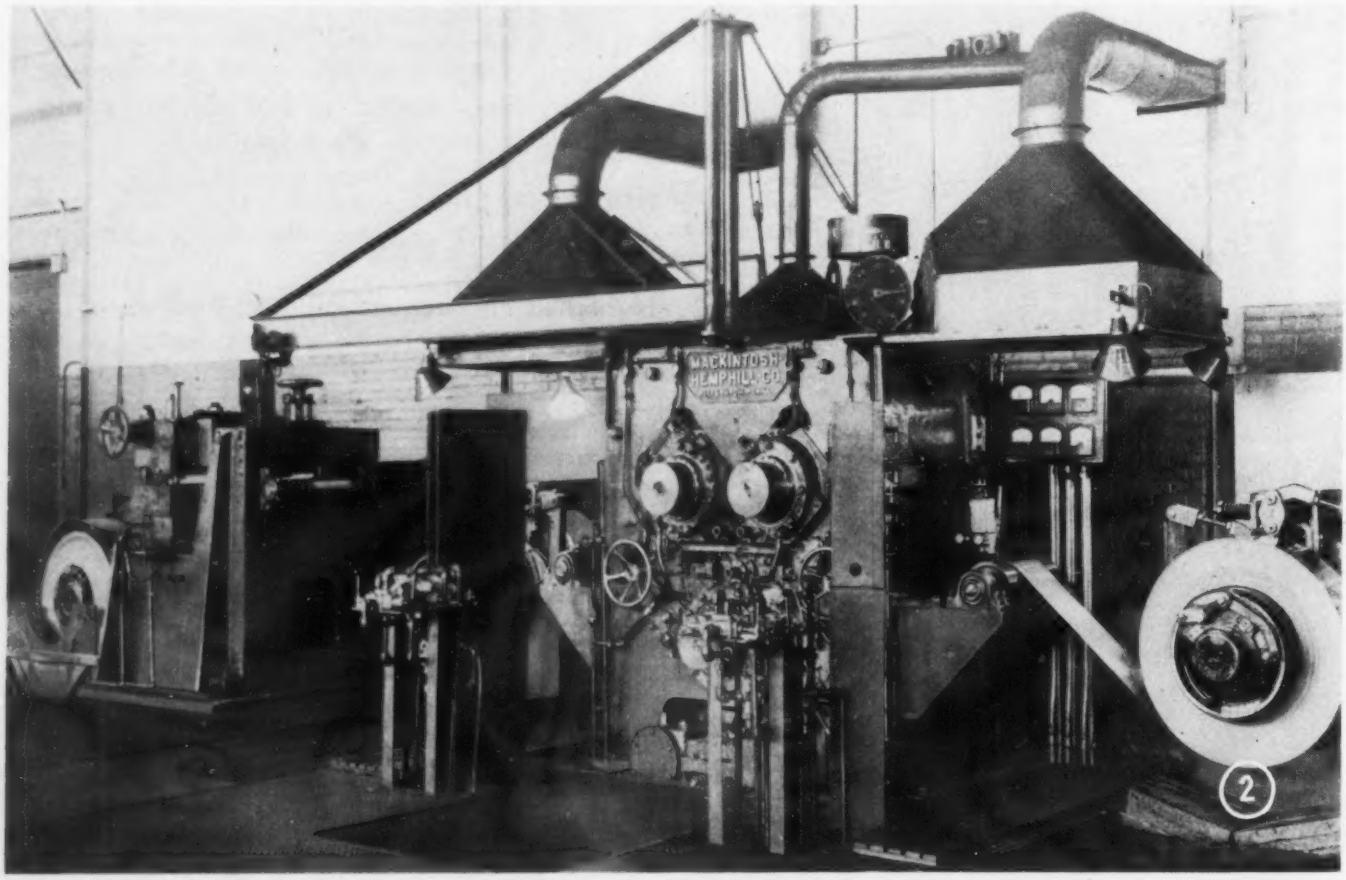
UNIQUE application of small diameter driven work rolls is incorporated in a new type of cold reduction mill, known as the Montgomery mill. It can transmit 900 horsepower through the necks of the working group of rolls, with peaks as high as 1100 horsepower. Efficiency is obtained by reduction in forward slip, sidewise spread, and of compressive resistance of metal due to small rolls. The ultimate results of the small rolls are greater overall reduction without intermediate annealing and extreme accuracy of gage.

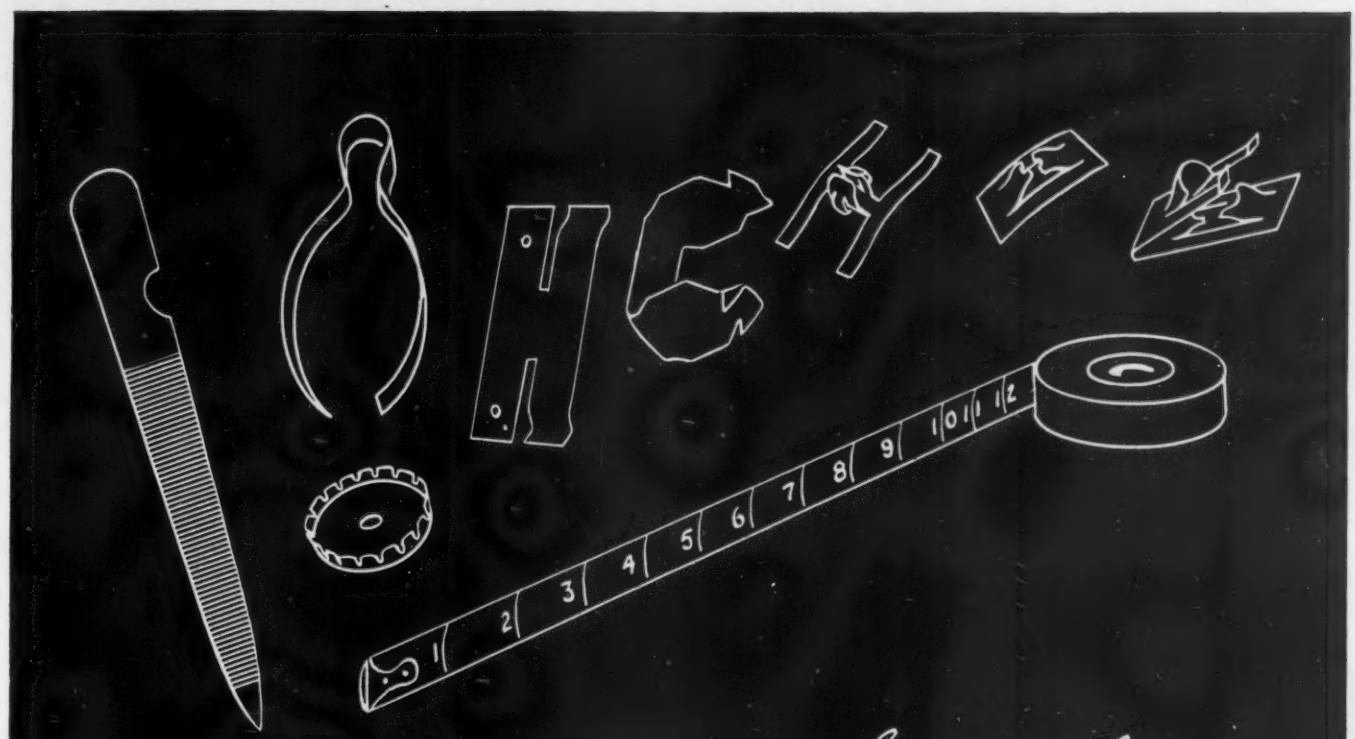
Rolling efficiency rises when the heaviest reduction possible is taken with the smallest diameter of work rolls feasible. The average rolling efficiency of 70 per cent with approximately 3-inch diameter work rolls drops to 50 per cent on 7-inch diameter rolls and lower on larger diameter rolls.

The mill is a 7-high unit with rolls arranged in the form of a "Y." A 6⅛-inch maximum diameter bottom work roll is supported along its body length by a 19⅜-inch diameter bottom backup roll. These two lower rolls are carried on housing screws and may be adjusted up and down to suit the thickness of strip to be rolled.

Timken bearings are used on the backup roll necks and Orange straight roller bearings on the driven roll necks. Babbitt-lined bronze sleeves are employed on the baby roll necks. Thrust from the bay roll is taken on quickly removable bridges mounted in the roll housings.

The mill is designed for total separating force of 720,000 pounds, allowing for the rolling of 17-inch wide strip at 42,500 pounds per inch width. This equals rolling on the basis of 120,000 pounds per inch strip





# CMP COLD ROLLED *Spring Steel*

## ...brings plus qualities to product and production

● In their critical search for the means of achieving higher product quality and greater production efficiency, more and more users of high carbon steel are turning to CMP Carbon and Alloy Spring Steel. If yours is a problem of product, production or profit you would do well to check the advantages of this precision material.

Because of its precision characteristics and consistent results CMP Spring Steel offers important plus qualities to both your production operations and your end product.

## CAN YOU AFFORD TO OVERLOOK THESE DISTINCTIVE ADVANTAGES?

- **Width and gauge are accurate to closest tolerances.**
- **Chemistry is held within proper range for best heat treatment response.**
- **Annealing is controlled for the ideal spheroidization.**
- **Decarburization is held to the absolute minimum.**
- **Physicals are uniform throughout every shipment.**

**Chances are we can help in your spring steel problems. . . . Write, wire or call.**

THIN STEEL

GIVES MAXIMUM PRODUCTION PER TON

**THE COLD METAL PRODUCTS CO.**
YOUNGSTOWN 1, OHIO

*Sales Offices*
NEW YORK • CHICAGO • DETROIT • ST. LOUIS
BUFFALO • DAYTON • LOS ANGELES

when using 16-inch diameter rolls on an average of 12-inch wide strip.

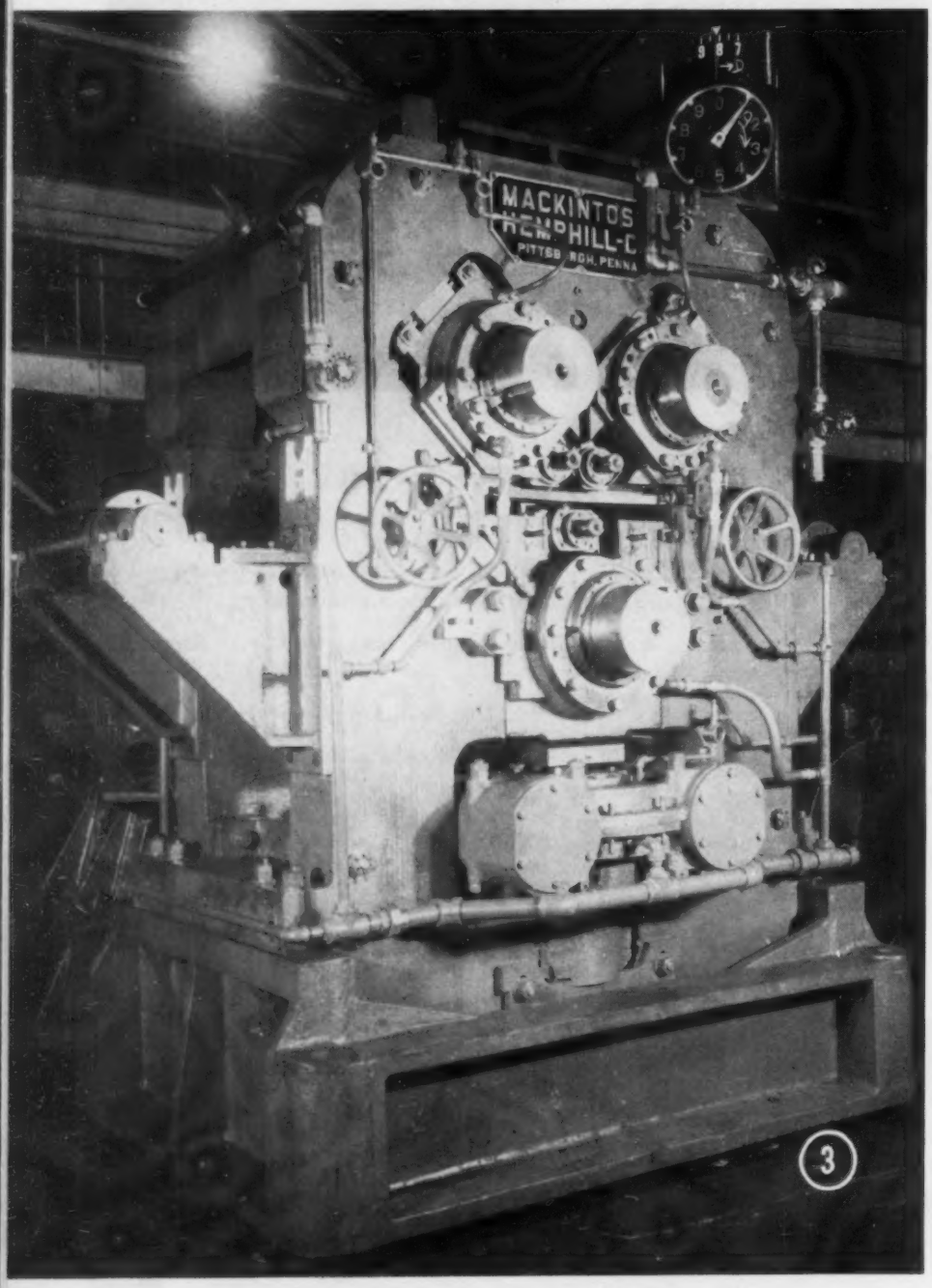
The 6-inch diameter bottom driven roll is more than five times as strong as regards sidewise deflection as would be a 4-inch equivalent diameter roll which produces the separating force actually found on the mill.

Above the strip and directly over the lower work roll, is a V-shaped group of five rolls. The bottom roll of this formation is a 3¼-inch maximum diameter baby work roll. Contacting this small roll on each side, at 45 degrees from the vertical and forming the legs of the "V," are two intermediate 6⅛-inch diameter rolls, each of which is supported by its own 17¾-inch diameter backup roll.

Each upper backup roll is clamped in place at the top of its housing window with a self-aligning rocker plate to provide protection for roll neck bearings against roll deflection. The two upper intermediate rolls and baby roll are balanced by springs or hydraulic cylinders, mounted in the lower work roll chocks to maintain roll contact between all rolls when the mill is idling.

The 6⅛-inch lower work roll and the two 6⅛-inch diameter upper intermediate rolls, are driven to spindles from the mill pinion stand. The diameters of the three driven rolls are matched to the normal variation in diameter allowable in 4-high mills. The baby work roll and backup rolls are not driven. The mill can be arranged with the driven rolls from 5¾ to 7¼ inches and baby roll from 2⅝ to 4 inches.

*Fig. 3—Closeup of a 20-inch Montgomery mill on the erection floor*




The lower work roll and backup roll are adjusted up and down on nonrotating housing screws. All screwdown parts are designed so that the rolls may be forced into the strip. The screwdown reduction is 2000:1, and is driven by a single 5-horsepower motor with a gear type mechanical clutch to each screw. Screw-type clutches are operated through solenoid actuated air cylinders.

Conventional strip coilers on each side of the mill provide sufficient tension to roll strip flat and tight on drum. Rolling torque is obtained through the driven roll necks.

The hot rolled coil is fed from payoff reel through a threader roller leveler, over the top of the left reversing reel on the first pass, and through the mill to the right reel. On the second pass, the strip is fed back into the left reel. All succeeding passes are made by reversing the mill and reels until the strip has been reduced as much as practical before annealing for a second series of passes if required. Each reel is driven by a 200 horsepower motor.

The drive consists of three driven roll pinions and two idler gears. The motor is directly connected to the lower 6⅛-inch work roll pinion by a flexible coupling. This pinion is connected to the lower work roll by a universal spindle. Upper pair of intermediate roll pinions are driven by idler gears. Two top pinions of the drive are connected to the intermediate rolls by universal spindles.

Other features of the mill such as deflector roll, oil seals, roll changing rigs, etc., are similar to conventional mill design. The 20-inch reversing mill is designed to roll maximum strip of 17 inches wide at a delivery speed from 600 to 1200 feet per minute. Coil buildup will range from 22 to 54 inches diameter. The 600 horsepower mill motor is connected to the three 6¼-inch diameter rolls.

The mill combines the advantages of accurate gage control, most satisfactory rolling of thin strip along with heavier gages, greater overall reductions, lower tension, higher deformation efficiency, reduced forward slip and spread, and lower roll pressures, with production equivalent to conventional mills with large diameter work rolls and equal power and at rolling speed up to 1200 revolutions per minute. The mill is applicable to high and low carbon and stainless steel for cold reduction and temper rolling.

---

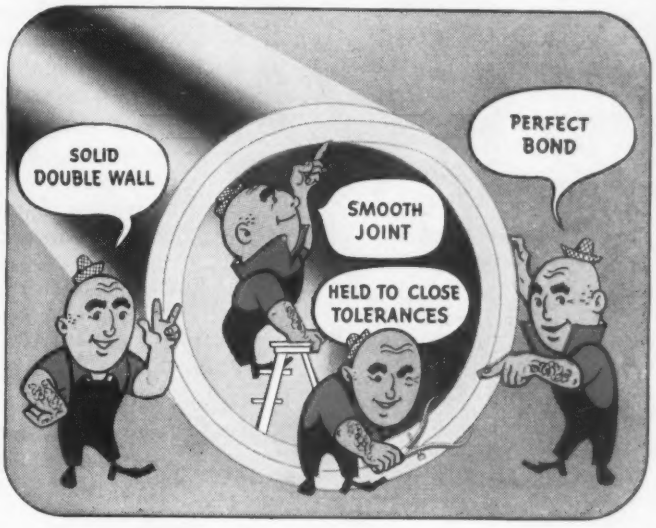
From a paper presented at the annual meeting of the Association of Iron and Steel Engineers, William Penn Hotel, Pittsburgh, Sept. 22-25, by W. M. McConnell, chief engineer, Mackintosh-Hemphill Co., Pittsburgh, and A. B. Montgomery, consulting engineer, Pittsburgh.

# Upping the output down on the farm

**1.** **TIME WAS** when plowing the standard 40 acres with a mule was work enough for any farmer. It required a strong back, sunrise-to-sunset hours in the fields and lots of patience. In contrast, farmers today can handle much larger fields with much less effort.

**2.** **KEY TO THEIR** present-day capacity is the remarkable new farming equipment—like super-efficient tractors that make plowing almost as easy as driving a car. But tractors weren't always so capable. Much of their efficiency can be traced to features like Bundyweld* Tubing.

**3.** **IN LINES** for carrying fuel, vacuums, oil and hydraulic fluids, Bundyweld gives highest efficiency to tractors. Bundyweld is important in hundreds of other products, too—in modern gas ranges, in freezer units and other cooling devices, in motor vehicles and in many other applications.




**4.** **BUNDYWELD** is different from other tubing. A single strip of basic metal, coated with a bonding metal, is rolled continuously twice laterally into tubular form, then metallurgically bonded by intense heat—carefully controlled—to form a solid, double wall tube, held to close dimensions.

**5.** **HUNDREDS** of engineers and product designers consistently specify Bundyweld. Chances are, Bundyweld can give better answers to your tubing problems, too. Why not let Bundy Research and Engineering Departments look over your product and see? Available in steel, Monel and nickel. *Bundy Tubing Company, Detroit 14, Michigan.*

**BUNDY TUBING**

★ ★ ★ ★

ENGINEERED TO YOUR EXPECTATIONS

*REG. U.S. PAT. OFF. ®

BUNDY TUBING DISTRIBUTORS AND REPRESENTATIVES:

| | | | | | |
|---|---|---|---|---|---|
| Pacific Metals Co., Ltd.<br>3100 19th St.<br>San Francisco 10, Calif. | Standard Tube Sales Corp.<br>76-01 Woodhaven Blvd.<br>Brooklyn 27, N.Y. | Lapham-Hickey Co.<br>3333 W. 47th Place<br>Chicago 32, Illinois | Rutan & Co.<br>404 Architects Bldg.<br>Phila. 3, Pa. | Eagle Metals Co.<br>3628 E. Marginal Way<br>Seattle 4, Wash. | Alloy Metal Sales Ltd.<br>861 Bay St.<br>Toronto 5, Canada |

# BEND TESTING

## Of Armature Binding Wire

BINDING wire, used in banding armatures of electric motors to hold the coils in place, is high-strength wire which may be either magnetic or nonmagnetic, depending upon the type of motor. It is covered with a continuous coating of tin to permit soldering after the band is wrapped. According to L. G. Toye and G. A. Baltus of the General Electric Co. Works Laboratory at Erie, Pa., any failure of armature bands means a wrecked motor, and for that reason extensive tests are made on shipments of wire to insure that the material is up to the standard required.

Physical tests customarily made are tensile strength, proportional limit and 180-degree bend, which indicates brittleness. The latter test consists of bending the wire against itself around a radius equal to its own diameter.

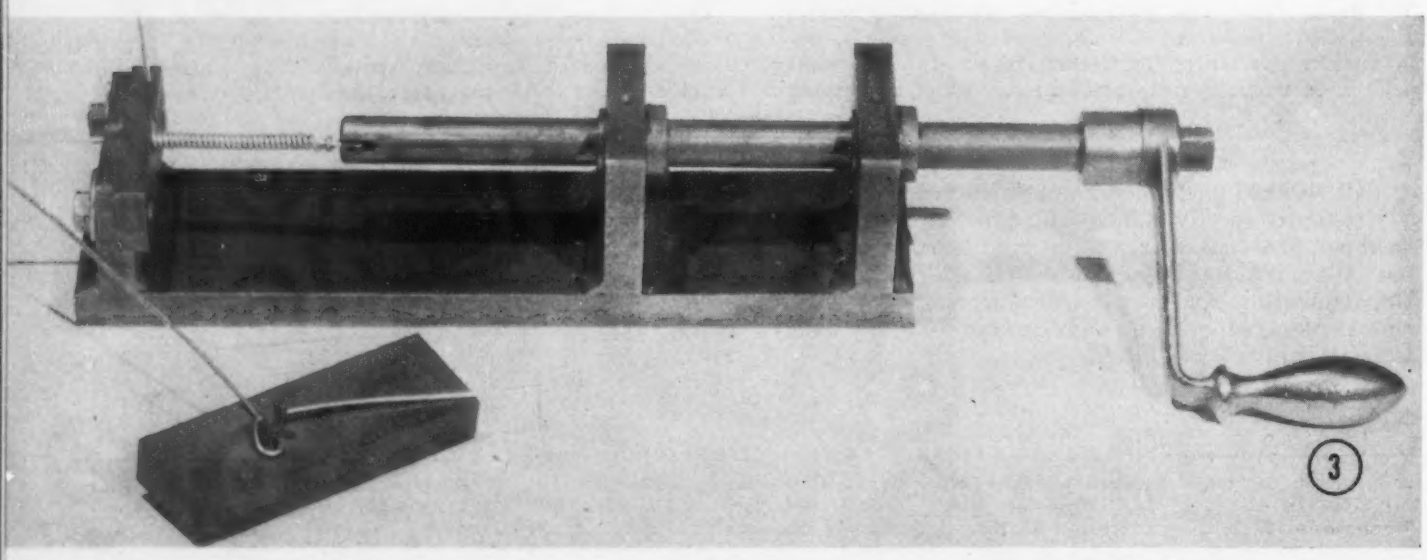
In testing a shipment of nonmagnetic wire, it was found that both good and bad bend tests were obtained on samples from the same coil. Microexamination revealed numerous defects on the surface of the wire beneath the tin coating, and also internal cracks of a greater or less degree as shown in Figs. 1 and 2.

If one of these defects was present at the point of bending, a failure occurred; if not, a good bend was obtained. This indicated that individual bend tests were not a satisfactory method of checking the suitability of the wire for motor manufacture. The solution appeared to be one of making a continuous 180-degree bend test over several feet of wire in order to detect the presence of intermittent defects.

The test and technique developed by General Electric proved so effective that it has become standard for testing of bending wire by the company. It is said to give positive indication of good or bad wire in about 30 seconds.

Test requirements were to coil the wire on an arbor of the same diameter as the wire itself. As there were several different sizes of wire to be tested, it was obvious that a portion of the wire could be utilized as the arbor. This resolved itself into a very simple fixture (Fig. 3) consisting of a base, spindle, crank and guide plate. A suitable guide plate is required for each diameter of wire.

Before coiling, a loop is formed on a block as shown in the foreground of Fig. 3. One end of the wire is inserted through the hole in the guide plate and the other end laid in the slot in the same plate. The spindle is brought forward and the loop inserted in the slotted opening. As the spindle is rotated the coiling wire forces the spindle forward. It requires approximately 30 seconds to form the loop and coil a test piece.



# Cost of Heater Tank Cut 25% by Welded Design

BY C. E. PULLUM,
VICE PRESIDENT IN CHARGE OF PRODUCTION
BELL & GOSSETT CO., MORTON GROVE, ILL.

One of the principal parts of the domestic hot water system manufactured by our company is the tank shown in Fig. 1. We formerly purchased this tank . . . the design shown at the right . . . from an outside source. Difficulty in getting deliveries led us to redesign it for arc welded steel construction and fabricate it ourselves. The welded design is shown on the left in Fig. 1.

The former casting weighed 90 lbs. The welded tank weighs only 40 lbs.; hence, is easier to handle and install. Reduction in cost of the tank only (exclusive of coils and fittings) has been about 25%.

## SIMPLIFIES PRODUCTION

Procedure for making the welded tank, which is 29½" high and 7⅝" in diameter, is very simple. The tank shell is a sheet of 10-gauge steel which is rolled and then butt-welded with one pass of "Fleetweld 5" electrode, 3/16-inch size.

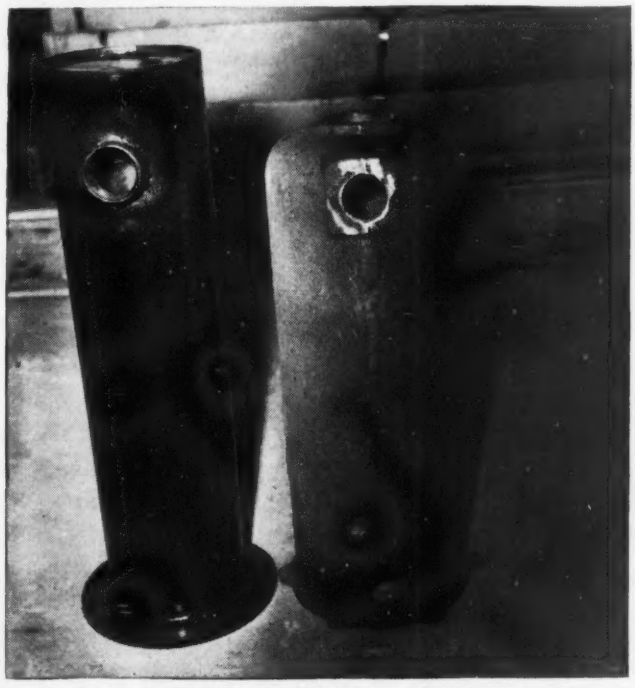


*Fig. 1. Tank of new welded design (left) and former design. Changeover to welded construction improved the tank and cut its cost 25%.*

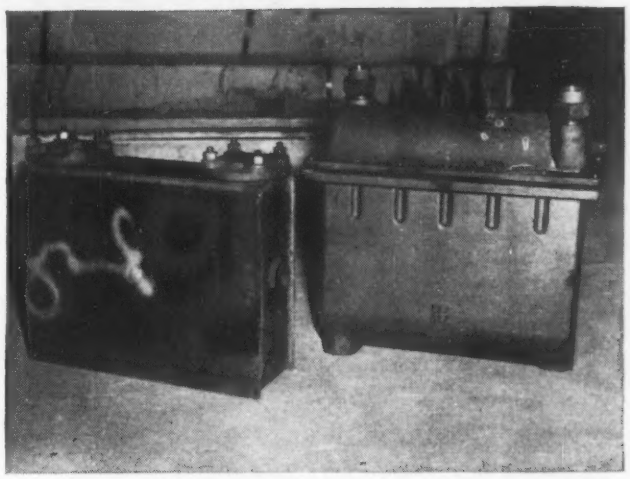


*Fig. 2. Tankless heater of welded construction (left) costs about 25% less than the previous construction (right). Its size and weight also have been reduced.*

Bottom flange of the welded tank is a ⅜" plate, cut to 10½" diameter. A piece 7⅝" in diameter is cut from the center of this plate and used for the top of the tank. This top plate is cut out with a 5-degree bevel to obtain 100% penetration when it is welded. It is pressed into the top of the tank and welded with one pass of "Fleetweld 5," ¼-inch size. The bottom flange is fillet-welded with the same electrode and a pipe connection welded in as shown.

## TANKLESS HEATER ALSO REDESIGNED

Another unit which has been changed over to welded design is a tankless heater. Fig. 2 shows the new welded design (left) and the tank of former construction. Its size, weight and cost have been reduced. Formerly it weighed 105 pounds and was 20" x 17" x 6", exclusive of flange. The welded design weighs 84 pounds and measures 18" x 14" x 6". Cost savings are about 25%.

This tankless heater is fabricated from two pieces of brake-formed 3/16" plate and is fillet-welded with "Fleetweld 5," ¼-inch size.

In exploring for savings with arc welding, we have found it wise to change over one part at a time rather than try to redesign the entire product at once.

*The above is published by LINCOLN ELECTRIC in the interests of progress.*
*Machine Design Sheets are obtainable by writing The Lincoln Electric Company, Dept. 1511, Cleveland 1, Ohio.*
*Advertisement*

# *Available*

COLD FINISHED

## ROUNDS - SQUARES - HEXAGONS - FLATS

*COLD FINISHED BARS • SHAFTING • TEMPERED AND ANNEALED SPRING STEEL • DRILL ROD • SHIM STEEL • COLD ROLLED STRIP STEEL • COILS AND STRAIGHT LENGTHS • ROUND EDGED STRIP STEEL • FEELER GAUGE • ROUND WIRES • STEEL BALLS*

The entire line of Gensco cold finished bars is most complete and ready for use on your production or tool room equipment to produce the most intricate parts.

Stocks include rounds, squares, hexagons, and flats from leading mills in a complete range of sizes and analysis—Bessemer and Open Hearth.

Gensco Sales Engineers will be happy to call and discuss your requirements as well as your steel working problems. Your order will receive immediate and thorough attention and your needs will be supplied to your individual exacting requirements.

**GENERAL STEEL WAREHOUSE CO., INC.**

*1830 N. Kostner Avenue, Chicago 39, Illinois • Belmont 4266*

CINCINNATI • MILWAUKEE • ST. LOUIS • NEW YORK

## Lubrication of Machinery

(*Continued from Page* 76)

all motion must be as nearly akin to perfect rolling as possible. Light bodied lubricants should be used wherever they can be successfully retained in such a bearing, commensurate with the temperatures and pressures involved. In the oil sealed type of bearing the oil viscosity can vary from 40 to 200 seconds Saybolt Universal at 100° F.

Wherever there is a possibility of oil leakage, however, or under conditions of dust, dirt or dampness, it may be advisable to use a specially treated oil, or to use grease as the lubricant. Greases furnish better seals against the entry of dust, dirt and moisture, thereby serving to protect the polished surfaces of the bearing elements in a very satisfactory manner. Grease also can be retained more dependably in a nonoiltight housing; on the other hand, dirt or grit that finds its way into a grease lubricated bearing has no means of settling out.

Where the grinding machine wheel spindle is built with plain or so-called sleeve-type bearings, the sight feed oil cup has been proven to afford the requisite degree of lubrication on some bearings especially where a wooden oil distributor is properly located within the bearing housing below the spindle. The three-part bearing is extensively used on certain of such machines, viz., a half box is located at the bottom and to the rear of the spindle housing. The top construction consists of two adjustable bearing segments. By means of suitable thumb-screws these latter can be readily adjusted to meet lubrication and pressure requirements without the necessity for stopping the spindle. This permits normal adjustment to be made without interfering with production.

Flood lubrication has been developed to a marked degree, especially for the preservation of spindles. Mechanical or automatic circulation of the oil to the essential wearing parts can be accomplished by means of a suitable chain-driven pump, or a pump which is driven directly from the wheel spindle. There must, of course, be adequate reservoir space with such a system to carry the requisite volume of oil and provide for proper settling.

Flood lubrication by means of oil circulation insures, perhaps, the greatest degree of operating cleanliness possible of attainment, for in addition to serving as a lubricant and coolant the oil will usually wash the entire system free of any accumulations of foreign matter. It is essential that there be an ample quantity of oil in the system and sufficient volume in the reservoir to allow for precipitation or settling out of the majority of any foreign matter which may have been taken up during circulation; otherwise, its passage through the oiling system may cause serious scoring of bearings and shafting. Modern design provides for filtering the oil.

A minimum of attention is required and normally but little adjustment is necessary in the operation of a flood lubricating system. Relative to adjustment, it is interesting to note that usually a suitable valve can be installed in the bearing cap or at some other accessible point to permit this. On grinding machines, where oil circulation adjustment is provided for in the bearing cap, an observation window or glass located in front of the bearing enables the operator to note the oil flow at all times.

Normal conditions of grinding machine spindle operation will permit the use of a light to medium bodied straight mineral spindle or machine oil, the degree of refinement depending to a large extent upon the type of lubricating system.

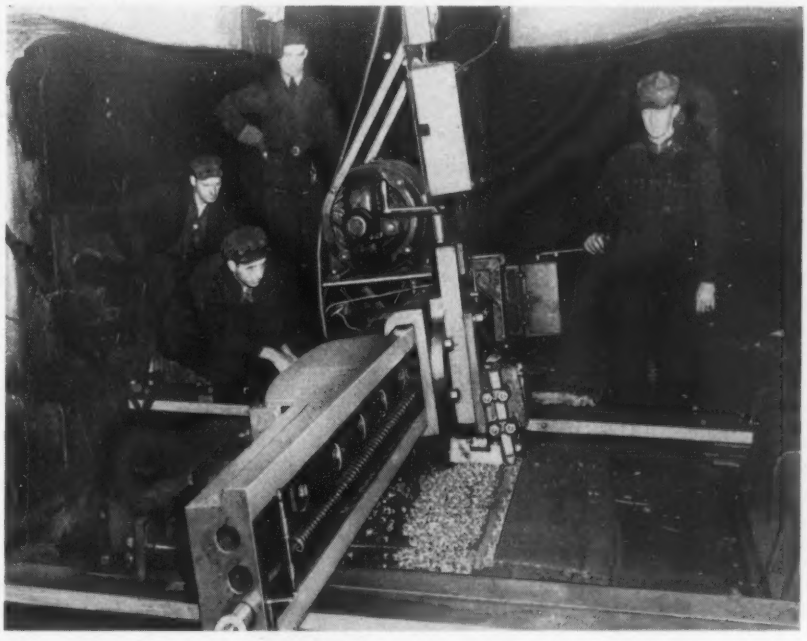
In sight feed oilers, as used for spindle lubrication on many machines, an oil of from approximately 100 to 200 seconds Saybolt Universal viscosity at 100° F will serve the purpose with a delivery of from about 7 to 10 drops a minute.

It is practicable to use this same grade of oil for the spring-actuated wick-oiled bearing. In the ring oiling device, however, a somewhat heavier product will be necessary, the viscosity ranging from 200 to 300 seconds.

Grinding machine bearings served by circulating systems can function normally on an oil of similar viscosity as mentioned for the spindle bearings. Re-usage of oil by circulation, however, imposes an important requirement upon any oil for such service; it must readily separate from water or other foreign matter, and not tend to develop emulsions to any extensive degree and it must be resistant to oxidation.

Attention must be paid to the degree of refinement of any oil under consideration. An oil should be used which has been so refined as to remove those hydrocarbon constituents which may lead to subsequent emulsification and oxidation, especially when the oil is agitated in the presence of air, and perhaps in contact with water or particles of metallic foreign matter.

In the application of high speed



**ON-THE-SPOT RESURFACING:** Badly dented, roughened and work hardened from subjection to heavy duty forging service, this 69-ton steel forging anvil was resurfaced in the 12,000-lb forging hammer by using a cross rail from an old planer as shown in the photograph. A ratchet feed and reversible motor were set up to drive the feed screw. Four planing tools, each measuring 1½ x 2½ x 12 in. were tipped with grade 78C carbide, made by Carboloy Co. Inc., Detroit. Reground only twice, the tools removed 648 lb of steel at 26 fpm and a feed of 1/32-in. Depth of cut varied from ⅛ to ⅝-in.

ball bearings to grinding wheel spindle service where speeds as high as 100,000 revolutions per minute may be developed, a method of oil-mist lubrication has been perfected using very light viscosity spindle oils ranging from 40 to 150 seconds Saybolt Universal at 100° F. The bearings on each end of the spindle develop a pumping action which causes the oil to circulate continuously around the spindle parts. External slingers effectively prevent entry of any outside dirt or liquid. By designing the bearing housing so that it will retain oil effectually, oil-mist lubrication has proved to be dependable, capable of protecting precision-finished ball bearings for lengthy periods, and keeping high speed grinding machines in continuous service. Air power as a means of developing an oil mist is also utilized on high speed spindle bearings, where the oil is fed drop by drop into a stream of low-pressure air which breaks up the oil into a fine mist.

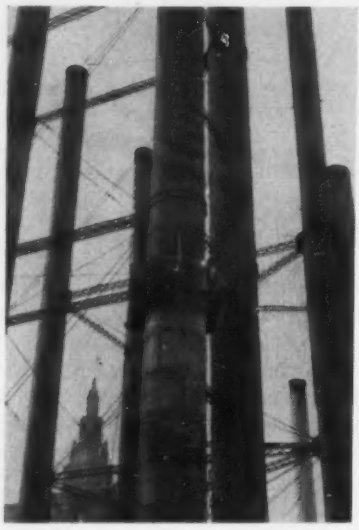
For those other wearing elements in the average grinding machine, including reversing mechanisms with their essential gears, cams and bearings, an oil should be used which will meet the requirements of both hand and bath lubrication. This latter is prevalent in many reversing mechanism housings.

The duty is not severe. Therefore, a medium bodied straight mineral machine oil will, as a rule, serve the purpose satisfactorily, the viscosity range being from 200 to 400 seconds Saybolt at 100° F.

There may, however, frequently be a problem in the lubrication of flat bearing surfaces such as V's and table ways, due to the varied pressure which may be developed. For this reason the utmost care should be paid to selection of the oil to be used, extent of viscosity or body required.

Lubrication of such surfaces can be accomplished by oil cups and suitable grooving of the ways, by application of the oil under pressure as in a force feed system or by the installation of rollers located in depressions which can be kept full of oil. The latter work automatically, for at each passage of the slide the respective rollers carry a film of oil up to the surfaces of contact, in much the same manner as a ring-oiler would lubricate a plain bearing. The modern force feed, filtering, oil circulating system is, however, regarded as most dependable.

Viscosity range to meet the pressure conditions of slide operation must of necessity be wide. Oftentimes, on smaller grinding machines it can be as low as 300 seconds Saybolt at 100° F. On the other hand, larger machines such as those designed for the grinding of steel mill rolls may require a lubricant as heavy in body as a steam cylinder oil, the actual viscosity being perhaps as high as 130 seconds Saybolt at 210° F. Oils which are fortified with oiliness agents are considered necessary for some types of way design.



**STEEL STACK REINFORCED: One - fourth - inch steel plate, cut and rolled so that four sections would circumscribe the 7 ft 6 in. diameter, was used in reinforcing this stack of a central steam heating plant of Cleveland Electric Illuminating Co., Cleveland. Using Fleetweld 5 shielded arc electrodes, made by Lincoln Electric Co., Cleveland, it was reinforced from the ground up to a height of 60 ft. Top of 120-ft stack was similarly reinforced several years ago. Plate joints, each beveled 60 degrees, were made with a stringer pass and a weaving bead**

High speed gears, and other motions, must be studied from the viewpoint of the extent to which centrifugal force will be developed and the lubricant thrown from the moving parts. Here there is more relationship between speed and the adhesive characteristics of the lubricant. This will be especially true on exposed gears. In an oil-tight gear housing a comparatively fluid oil can be used, especially if it is automatically delivered to the parts and not merely carried around as the gear teeth dip in the bath of lubricant.

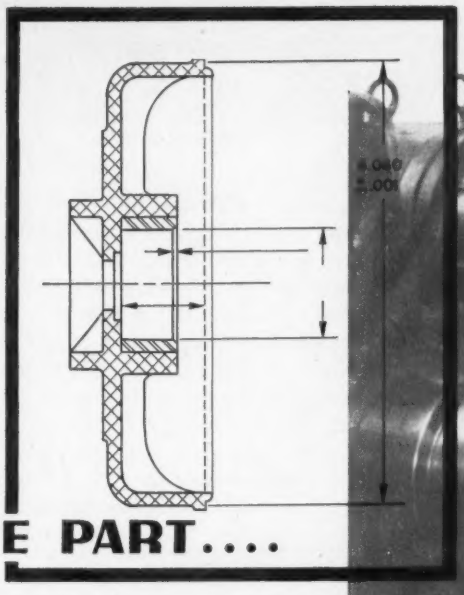
Maximum protection of any grinding machine lubricant can be assured by keeping the lubricating system as free from foreign matter as is consistently possible, according to the operating conditions and bearing construction. There is always a possibility of entrance of impurities, especially where bearings may not be properly sealed. Continued churning of abrasive foreign matter with oil and its passage through plain bearing clearance spaces or in contact with highly polished balls and raceways will ultimately ruin any bearing.

Systems served by sight feed oilers will in general require more frequent attention than ball bearings, due to the fact that their housings may be less carefully designed. Cleaning of drip-oiled plain bearings may be necessary or advisable at periods ranging from every two weeks to every several months. With ball or roller bearings once or twice a year is sufficient, unless operating conditions are especially dirty. Antifriction bearings, however, are more delicate from the viewpoint of construction, and therefore, the lubricant should not be allowed to become as contaminated as is permissible with other types of bearings.

Circulating oil systems, in turn, possess natural advantages in that the flood of oil which is constantly passing through the bearings tends to wash out any grit, dirt, dust or metallic particles that may have gained entry. As a result, wear is reduced to a minimum just as long as the oil in the system does not become so highly contaminated as to be unable to precipitate such foreign matter during its period of so-called rest. For this reason the condition of the oil should be carefully watched and the system drained as soon as any excess of dirt becomes apparent in the reservoir or settling chamber.

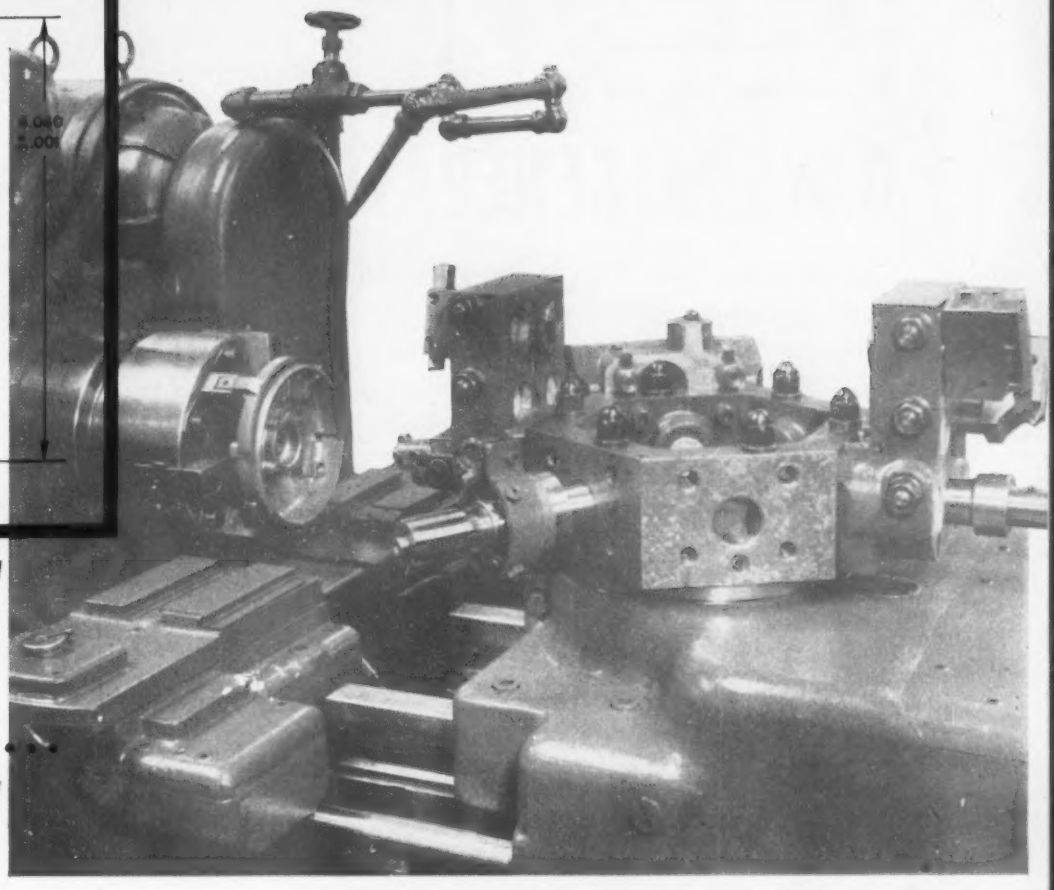
Lubricants for grinding, honing, lapping and super-finishing machinery used to be selected in a more or less haphazard manner. The plant lubricating engineer has brought about a decided change for the better in many plants.

Under the high speed conditions which prevail in the average grinding machine, knowledge of lubricant suitability is highly essential for the most efficient performance, for the modern grinding machine has passed beyond the stage of guesswork in regard to lubrication. One must be positive that lubricants are capable of affording maximum protection to all moving parts. As speeds increase very often boundary lubrication is approached.



## THE PART....

*(die cast aluminum motor end bell with steel insert)*



## THE METHOD.....

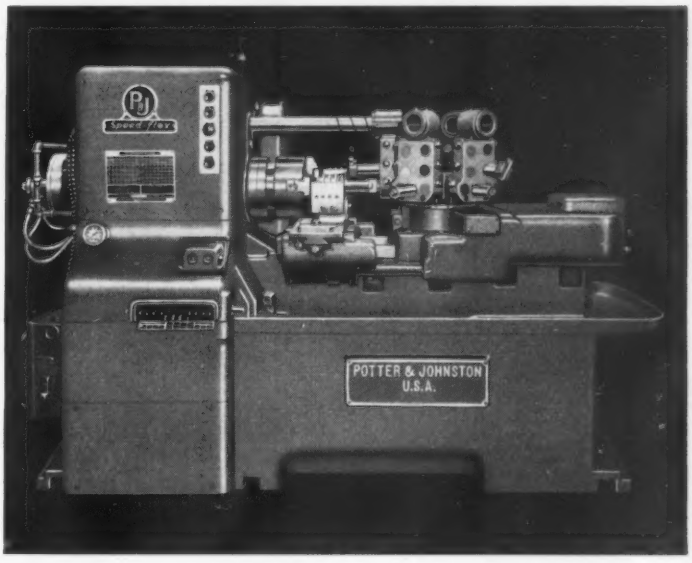
*(one operation, starting with boring hole in steel insert)*

## THE MACHINE.....

# 3-U SPEED-FLEX

## *automatic turret lathe*

Here is a die cast aluminum motor end bell with a steel insert. The 3-U SPEED-FLEX, occupying only 16 square feet of floor space, TURNS OUT 42 PIECES AN HOUR! The 3-U SPEED-FLEX has been developed for machining castings and forgings—both ferrous and non-ferrous—up to 6 inches in diameter. Small size, wide range of operations: simple, convenient controls, quick chucking, speed and accuracy of all operations; these are factors of utmost importance, whether you are considering a single machine or a battery. Drop us a line. We will be glad to furnish a complete description. Better yet, send us blueprint—or part itself—for guaranteed production data.




| | |
|---|---|
| *Total cutting time (one operation)* | 1.05 minutes |
| *Allowance for chucking* | .15 seconds |
| *Total time* | 1.20 minutes |
| *Pieces per hour* | 42.5 |

# Potter & Johnston Machine Co., Pawtucket, R.I.

## *Past and Present Developments in*

# OXYGEN GENERATION

By E. P. STEVENSON
*President*
Arthur D. Little, Inc.
Cambridge, Mass.

*Low-pressure system employing reversing exchangers are suitable for production of oxygen up to 2000 cubic feet per hour. Transportation is an important factor in determining cost of oxygen to the consumer. Output of oxygen is increased by reducing the purity specification*

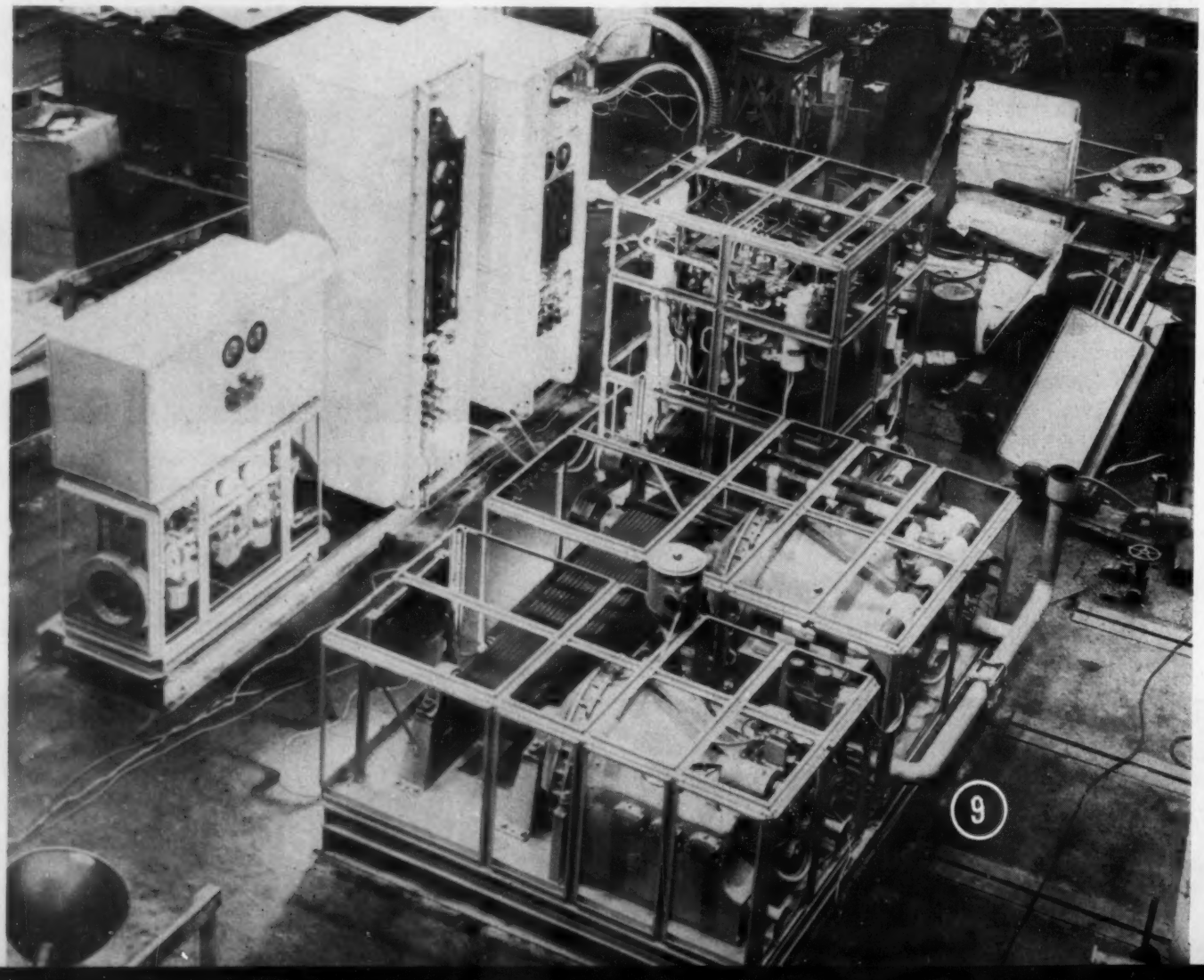
DESIGN of reversing exchangers presents many problems. Methods of assembling and fabricating the concentric tubular type of exchanger used by Dr. Collins were studied by several contractors during the NDRC program, and other problems associated with the operation of these exchangers have been fully described[1]. Application of this type of exchanger to various units of military design is briefly described in other recent publications[2]. For those desiring still further details complete reports are on file in Washington and can be secured through the Office of Technical Services, Department of Commerce.

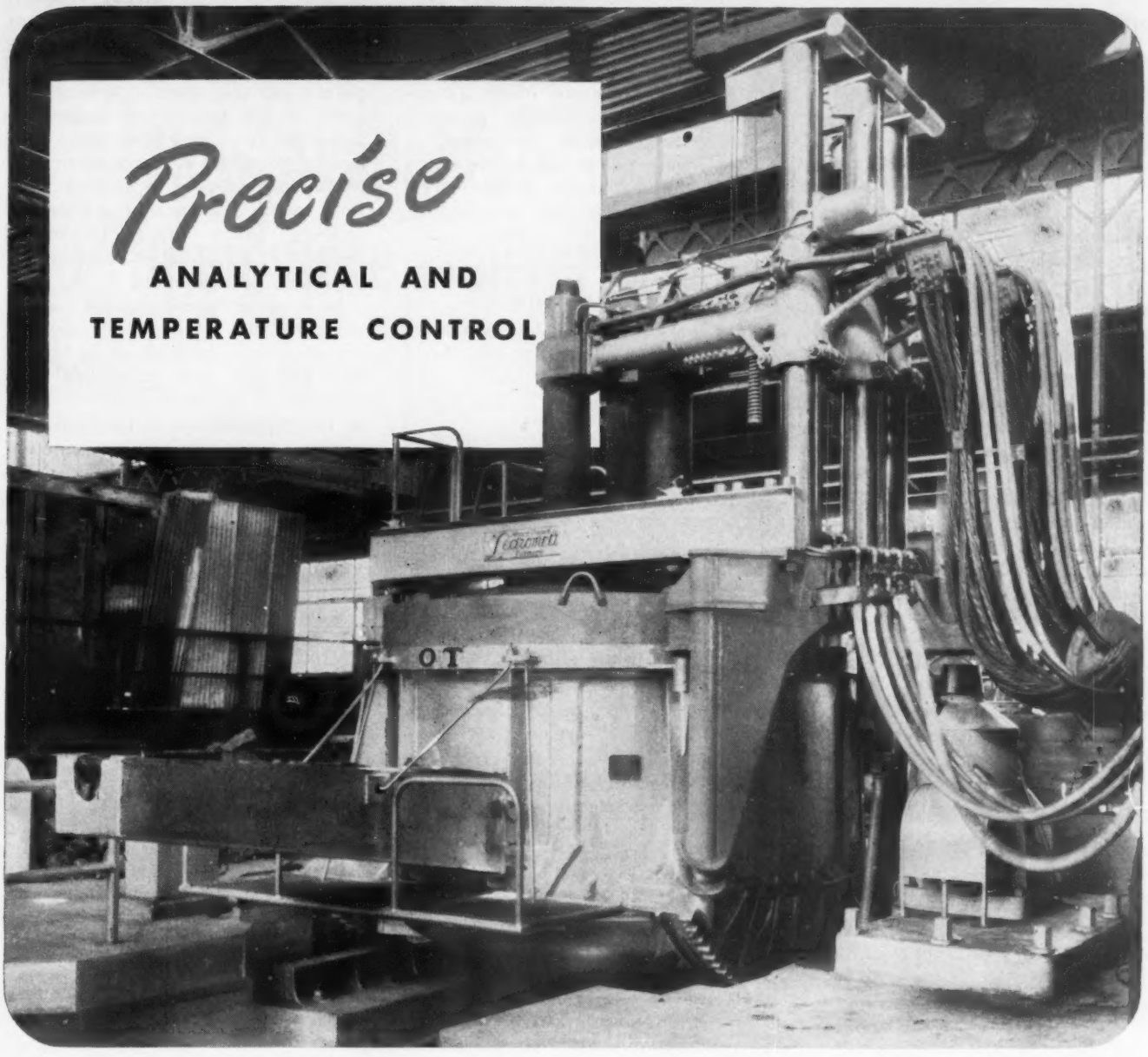
Under a directive from the Army Air Forces and the Engineer Board, NDRC undertook to design and later to arrange for the procurement of a number of truck-mounted units having a capacity of 1000 cubic feet of high-purity gas per hour. These units or plants were designed by the M. W. Kellogg Co. and built by Clark Bros. Inc. In addition to those procured in this program for the Air Forces and Engineer Board, an appreciable number of units were built for Russia with the modification that this latter group of units was skid-mounted. Finally, some of the units ordered by the Air Forces were modified in design to permit breakdown into a number and size of packages which could be flown in one of our large transport planes (Fig. 9). The use contemplated was that in connection with permanent advance bases in the Pacific theater. These units employed the low-pressure cycle. The mechanical features of these Clark units are particularly notable: Collins-type heat exchangers previously referred to; light-weight reciprocating air compressors delivering at 95 pounds per square inch and using carbon rings to eliminate the need of using oil lubricants; light-weight reciprocating oxygen compressors capable of charging cylinders at 2000 pounds per square inch and using carbon rings to avoid the use of lubricating

[1] All references are presented at the end of this article.



*Fig. 9—Test assembly of Clark-Kellogg air-transportable oxygen generator*






## FOR THE MELTING AND REFINING OF **QUALITY** STEELS AND IRONS...

★ Precision control means money to you—money saved by the elimination of much of the ordinary production waste and spoilage—money gained by the manufacture of a superior product. And when it comes to the melting and refining of iron and steel, the best in precision control is Lectromelt.

Lectromelt furnaces, with their patented counter-balanced electrode arm control, their time and labor saving top-charge feature, their versatility, flexibility and all-around excellence of performance, are the top equipment in the field. Their daily use by thousands of metal melters testifies their superiority.

*For complete details about Lectromelt furnaces as applied to your needs, write today.*

## MOORE RAPID *Lectromelt* FURNACES

*Manufactured in:*

| | |
|---|---|
| England | Birlec, Ltd., Birmingham |
| France | Stein et Roubaix, Paris |
| Spain | General Electrica Espanola, Bilboa |
| Belgium | S. A. Belge Stein et Roubaix, Bressoux-Liege |

**PITTSBURGH LECTROMELT FURNACE CORP.**
PITTSBURGH 30, PA.

oil; a single distillation column of novel design.

It should be noted that use of physical means for purifying air in low-pressure cycles was first employed by Mathias Frankl, in Germany in plants built in the middle thirties[3]. Frankl used cold accumulators rather than reversing exchangers. By reversing these accumulators between the influent and effluent streams carbon dioxide and water are frozen out in the interstices of cold accumulators formed by closely wound coils of corrugated metal, usually aluminum. In one half of the cycle the cold streams of oxygen and nitrogen from the distillation column are passed through two of these cold accumulators to accomplish the re-evaporation of the carbon dioxide and water deposited in the preceding one-half cycle and to cool down the mass of metal and condition it for reuse in the purification half-cycle. One of the disadvantages of this system is that the oxygen stream is necessarily contaminated, and high purity oxygen —that above 99 per cent—cannot be produced by these means. The oxygen produced hereby, however, is sufficiently pure for many industrial purposes (90 to 95 per cent), and it is probable that plants of this type will find some commercial application in the United States. It is reported that one such plant is now in course of construction.

Low-pressure systems for which the reversing exchangers were developed possess in themselves certain advantages. The difference in power cost is significant when dealing with large-tonnage industrial uses for oxygen where cost is the first consideration. For certain anticipated industrial applications involving comparatively small plants—those producing say between 1000 and 2000 cubic feet of oxygen per hour—a low-pressure cycle employing reversing exchangers possesses other advantages. The lower pressure is probably less hazardous and the output of low-pressure plants can be varied to meet changing needs. Furthermore, low-pressure units can be designed so as to require no operator attendance except while starting up, shutting down, or maintaining equipment.

**CORRECTION**

In part one of this article, STEEL, Oct. 20 issue, p. 114, the captions should have read:

Fig. 3—Linde cycle with auxiliary ammonia refrigeration

Fig. 4—Cascade system for liquefying and distilling air

Fig. 5—Claude cycle for liquefying and distilling air using expansion engine

Fig. 7 — Oxygen generator for use aboard aircraft—with housing and insulation partly removed

Fig. 8—Collins reversing heat exchanger

A second major contribution of the OSRD oxygen program to the development of the low-pressure cycle for the separation of oxygen from the air was in connection with the expansion engines, both reciprocating and rotary. Design features contributed by Dr. S. C. Collins resulted in small expansion engines of the reciprocating type having adiabatic efficiencies as high as 85 per cent. Studies directed by J. S. Swearingen resulted in similar improvements in the design of turboexpanders[4]. Postwar investigations of paralleling developments in Germany disclose the use of turboexpanders having an efficiency of only 53½ per cent, which is the order of efficiency reported for expansion engines of the reciprocating type used in this country before the war in medium-pressure plants of the Claude type. With many of the prospective large-scale industrial uses dependent upon producing oxygen at a cost substantially below that of prewar production in this country, expansion engine efficiency, which largely determines the cost of refrigeration, becomes an important consideration.

In a low-pressure gaseous oxygen producer, the whole of the refrigeration output is used up as insulation loss and heat exchanger inefficiency. In a liquid producer most of the refrigeration is used to compensate for the sensible and latent heat of the delivered product. In either case the efficiency of the refrigerative mechanism is important because it determines the horsepower expenditure per pound of oxygen produced.

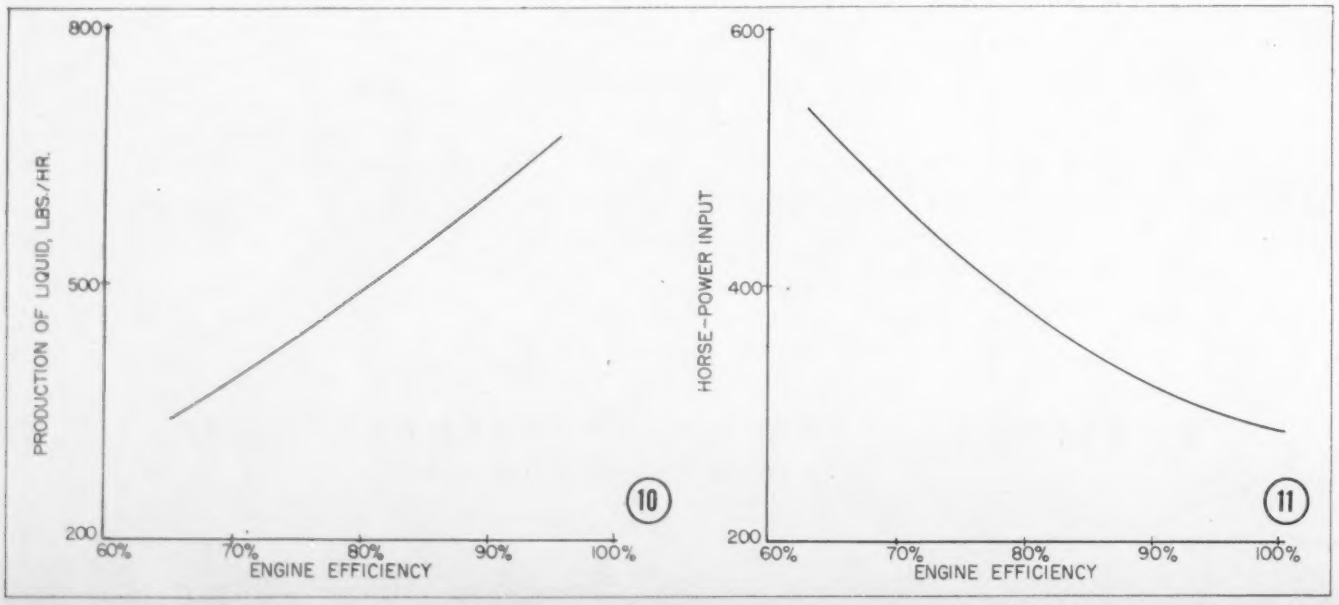
Adiabatic expansion is the most efficient method of producing the required refrigeration, and the efficiency of the expansion engine is, therefore, one of the determinants of the power costs per pound of oxygen. The exact manner in which power cost varies with expander efficency will depend upon the size of the plant and the efficiency of heat exchangers and insulation. In the case of one plant producing 500 pounds of liquid per hour with a normal expenditure of 400 horsepower, using a reciprocating expansion engine operating at 80 per cent efficiency, a 1 per cent change in expander efficiency causes a change in production rate of approximately 20 pounds per hour, or about 4 per cent of total production. (Fig. 10).

If the plant production is held constant and the necessary power input is plotted against expander efficiency for the same size plant, the curve is about as follows: (Fig. 11). Neither of the graphs is a straight

*Fig. 10—Relation of rate of liquid oxygen production to efficiency of expansion engine*

*Fig. 11—Relation of power input to expansion engine efficiency, for constant output of liquid oxygen*





# New Ozalid Streamliners Now Available For Immediate Delivery

**Now, you can order—and promptly receive—a new, moderately priced print-making unit that gives you these 5 new advantages at no extra cost:**

1. **SPEED.** In 25 seconds an Ozalid Streamliner reproduces your engineering drawings . . . or anything typed, drawn, printed or photographed on *translucent* paper.

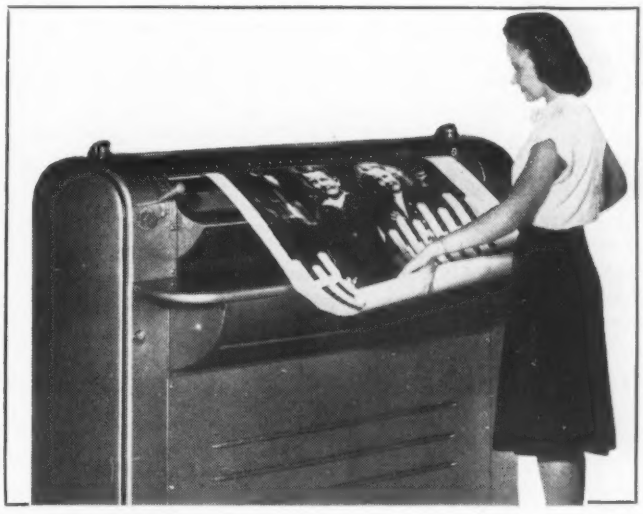
2. **EFFICIENCY.** You always get an exact-size positive (not negative) copy direct from your original . . . produced in 2 quick steps—Exposure and Dry Development.

3. **ECONOMY.** An 8½" x 11" print costs you less than one and a half cents per copy.

4. **VERSATILITY.** The lines and images on your original can be reproduced in black, blue, red, sepia, yellow . . . on paper, cloth, foil, film, or plastic.

5. **SIMPLICITY.** Anyone can be the operator. Place your original on Ozalid paper and feed into the Streamliner; that's 95% of the job.

**Now an easy desk job.** You remain seated, relaxed. All controls within easy reach. Prints are delivered on top, completely dry. Another advantage: You can install your Streamliner in any drafting room or office. Only 6 square feet of floor space is required.



**A minute ago—engineering drawings.** Now she's producing beautiful Ozalid Dryphotos in seconds, in exactly the same manner. Note the size: Ozalid prints can be up to 42" wide, any length. You can reproduce advertising posters, accounting reports—the work of all departments.

### Expanded Production Facilities Now Permit Immediate Delivery

Thousands of Streamliners already installed. The following list is a typical cross-section of users:

Armstrong Cork Company
Bethlehem Steel Corp.
Bloomingdale Brothers
Bulova Watch Company
Chris Craft Corporation
Chrysler Corp.
Columbia Broadcasting System
Dun & Bradstreet
E. I. DuPont
General Electric Co.
General Motors Corp.
International Harvester Co.
Lever Brothers
Montgomery Ward Co.
New York Central Railroad
Northern Pacific Railway Co.
Pan American Airways, Inc.
Paramount Pictures, Inc.
Parke, Davis & Co.
Pittsburgh Plate Glass Co.
Remington Rand
Scovill Manufacturing Co.
E. R. Squibb & Son
Standard Oil Co.
Swift & Co.
Westinghouse Electric Co.

**MAIL COUPON TODAY FOR FREE BOOKLET**

DEPT. NO. 356

**OZALID** Division of General Aniline & Film Corporation, Johnson City, New York

Gentlemen: Please send free, 24-page, illustrated booklet . . . showing all of Streamliner's uses and 10 types of Ozalid prints.

Name_____

Position_____

Company_____

Address_____

Ozalid in Canada—Hughes Owens Co., Ltd., Montreal

line because of the following considerations:

1. As the expander efficiency falls more work must be done by the compressors, either in the form of greater volume delivered or higher pressure or both depending upon other characteristics of the plant.

2. Lower expander efficiency means less power recovery from the expansion engine and therefore a greater demand upon the prime mover.

3. If a greater volume of air is processed to compensate for lower expander efficiency, then heat exchanger losses become higher.

4. If lowered expander efficiency is compensated for by compressing the air to a higher pressure, then expansion occurs through a higher expansion ratio, and this is detrimental to efficiency.

There are other considerations that must also be taken into account, but in general the ones listed above are controlling.

In addition to the technical developments, wartime experience has contributed in another way to the growth in these industrial uses of oxygen, which played a most important role in speeding up the construction of ships and the fabrication of war equipment and munitions and in rushing through the construction of essential wartime plant facilities. The use in 1944 of over 18 billion cubic feet of oxygen saved millions of manhours in labor. The ability and resourcefulness of the established industry in meeting the wartime demand for oxygen was a great contribution to our total war effort. The U. S. consumption of high purity oxygen in the first postwar year, 1946, was 11 billion cubic feet, compared with a 1939 level of 4½ billion cubic feet. This oxygen was largely consumed in those applications which had become established before the war, although usage was greatly expanded during the war. Recent estimates of the Linde Air Products Co.,[5] indicate that various outlets for oxygen at present consume approximately the percentages presented in the accompanying table.

**DISTRIBUTION OF OXYGEN CONSUMPTION, BY END USE**

| | Sub Total, % | Total, % |
|---|---|---|
| Steel Industry: | | 40 |
| Machine scarfing | 6.5 | |
| Hand scarfing | 23.0 | |
| Other production | 8.5 | |
| Maintenance | 2.0 | |
| Steel Fabrication: | | 25 |
| Plate edge preparation | 7.5 | |
| Other cutting | 15.0 | |
| Welding | 2.5 | |
| Industrial Maintenance | | 8 |
| Miscellaneous Uses: | | |
| Scrap iron production | | 6 |
| Chemicals and petroleum | | 5 |
| Automotive and aircraft | | 4 |
| Medical and breathing oxygen | | 3 |
| Other industries | | 9 |
| | | 100 |

Wartime developments in oxygen generation were in large part necessitated by the extreme difficulty of transporting oxygen by conventional methods under wartime conditions. This same problem of transportation has also been a vital one in the industrial field and is an important factor in determining the cost of oxygen to the user. Steel cylinders commonly used for transporting relatively small quantities of oxygen require the shipment, and return, of 7 pounds of container for each pound of gas, even though the gas is under 2000 pounds per square inch pressure. Increasing demand on the part of individual users led to development, in the late 1930's of two new methods of transportation, the truck trailer carrying several vessels containing gas at high pressure and the insulated railroad tank car carrying liquid oxygen at approximately atmospheric pressure. The truck trailer carries about 3000 pounds of oxygen and the tank car about 62,000. Although the liquid in the tank car is at atmospheric pressure, loss by evaporation during shipment is small; at the consuming point the liquid is vaporized and stored at 2000 pounds per square inch. Still another attack on the transportation problem has been the construction of plants near large consumers and delivery of the oxygen by pipeline. Since transportation is such a large factor in the cost of oxygen, cost varies widely depending on the method of transportation used, which is in turn partially dependent on the volume consumed. A recent survey showed prices ranging from $3.00 to $20.00 per 1000 cubic feet, or from $65.00 to $450.00 per ton.

It appears that the wartime technical developments in oxygen production will lead to an extended use of the consumer-operated plant, both for the new, large-scale outlets for oxygen which have been so much discussed in recent months and for the relatively small-scale established uses in the metalworking industries. Development of the low-pressure cycle makes possible comparatively small and simply-operated plants. The extent to which such consumer-operated plants will actually compete with the present commercial producers and distributors of oxygen will depend largely on the degree to which convenience factors such as ease of maintenance, nearly automatic operation, and easily controllable output rate can be designed into the small plant. In any event, the competition between the consumer-operated plant and the established oxygen producers will probably be evolutionary, rather than revolutionary; and, with the market for oxygen in its established uses increasing, the existing producers will probably not be too adversely affected for a long time.

Considerable confusion hovers over the question of the purity of oxygen as produced by the low-pressure cycle. It is true that many of the proposed large-scale outlets plan to use oxygen of a purity substantially less than the 99.5 per cent now standard, since this high purity is not required by these outlets. It is also true that low-pressure plants of the Frankl type, built in Germany, cannot produce high-purity oxygen. However, it must be emphasized that the low-pressure plants of the type developed in the United States during the war do produce oxygen of a purity equal to the present standard. It may be that many of the applications now using high-purity oxygen would find a product of lower quality, at least down to 98.5 per cent, equally satisfactory. In such instances, the production of a low-pressure plant may be substantially increased by reducing the purity requirement. In one instance, the output was increased 25 per cent by reducing the purity specification from 99.6 to 98.7 per cent.[6]

Perhaps more than in any other way, the war influenced the oxygen picture by bringing into it many technologists not previously in contact with oxygen production. In addition to the new technical possibilities generated by this association, many engineers were educated in the techniques of oxygen production and many general engineering firms became interested in the potentialities apparent in the designing and building of oxygen plants. These firms are now in a position to build large-scale oxygen plants and, as a result, many possible applications of oxygen which were only proposals before the war have been brought into much closer focus.


**REFERENCES**

(1) Air Purification in the Reversing Exchanger. W. E. Lobo & G. T. Skaperdas. *Chemical Engineering Progress*, Feb. 1947.
(2) Developments in Oxygen Production. J. Henry Rushton & Earl P. Stevenson. *Chemical Engineering Progress*, Feb. 1947.
(3) Frankl Patents, U. S. 1,890,646; 1,963,840; Re 19,140. The Separation of Gases. M. Ruhemann. Clarendon Press, Oxford, 1940, pp. 174 et seq.
(4) Turbo-Expanders. Judson S. Swearingen. *Chemical Engineering Progress*, Feb. 1947.
(5) Oxygen — Past, Present and Prospects. *Chemical Engineering*, Jan. 1947, pp. 123-131.
(6) Oxygen by Fractionation at Low Pressures. Walter E. Lobo. *Chemical Industries*, July 1946.



Condensation of a paper presented at the annual general meeting of the American Philosophical Society, Philadelphia, April 25, 1947.

# *Are you getting Maximum*

# Productive Power

## FROM YOUR PLANT ELECTRICAL SYSTEM?

Up-to-date production machinery cannot be utilized fully with an obsolete power distribution system. Efficient methods of manufacturing demand modern electrical power supply and control.

Thus, getting *maximum* Productive Power from your plant electrical system is of vital concern to every key production man—as well as those directly in charge of electrical installations and maintenance.

On the next two pages you will find specific ways to make *electrical power more productive* —one or more of which can be put to profitable use in your plant.

**FOR ANSWERS TO QUESTIONS LIKE THESE—TURN THE PAGE**

1. What is the most flexible and economical distribution system to meet changing production requirements?
2. How is a large steel plant saving $1,500.00 per month in power costs?
3. How are automatic circuit breakers saving $2,000.00 per year in outage costs?
4. How can control centers improve continuous processing operations?
5. What type of power conversion has cut maintenance costs as much as 66%?

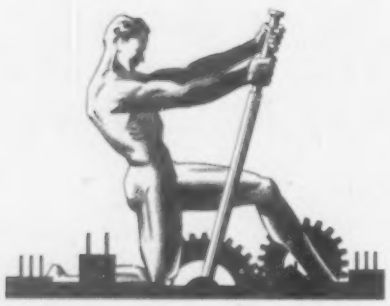
WESTINGHOUSE

# Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

# *Proved ways to* Make Electrical

## TO SPEED PRODUCTION CHANGEOVERS . . .



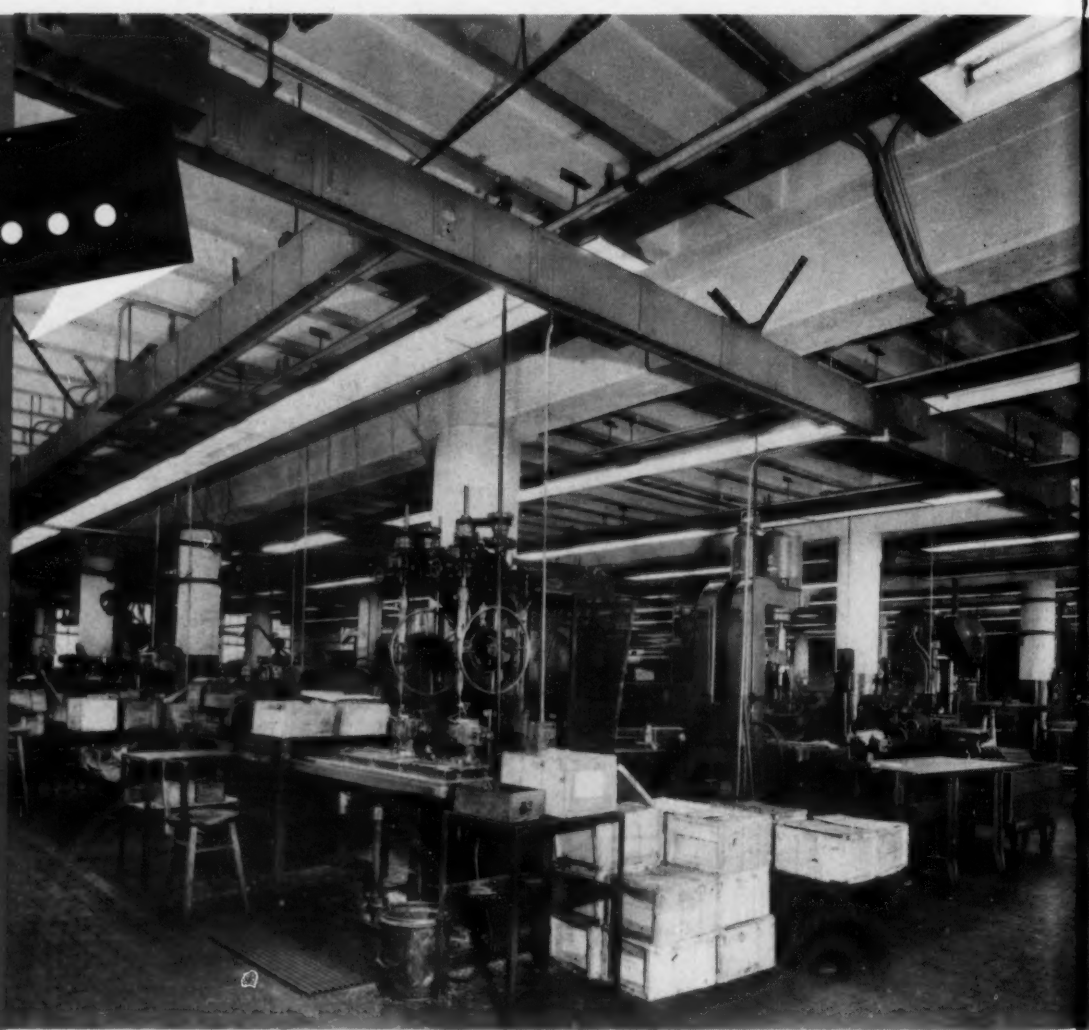
**PRODUCTIVE POWER**

Check these typical examples of the ways improved power distribution and utilization can boost plant efficiency. They are equally adaptable whether you are planning a new plant or modernizing existing facilities.

These are but a few of the time-saving, cost-cutting applications possible with the complete line of Westinghouse plant electrical equipment. Skilled Westinghouse engineers, with a practical knowledge of production techniques in *your* industry, are ready to help you on specific problems. For engineering help, just phone or write your nearest Westinghouse office.

## FASTER . . .

**Bus Duct speeds production changeovers** . . . in this large Chicago plant. Machinery can be relocated faster, since power is taken off wherever needed by plugging in right at the load. Flexible, convenient power distribution is provided without long secondary cable runs. Future production line shifts need not be delayed by expensive relocation of power distribution facilities.



WESTINGHOUSE

# Power More Productive

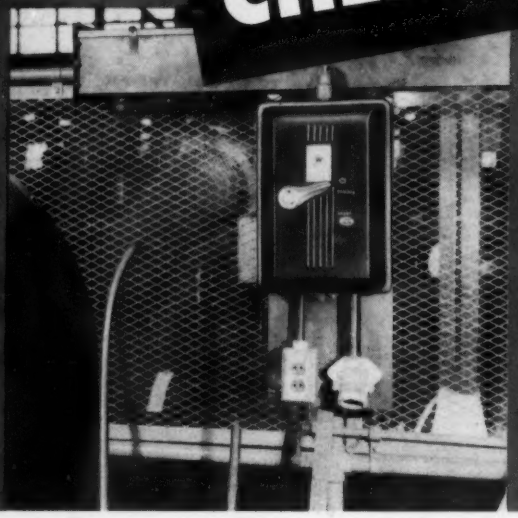
## CUT POWER COSTS...REDUCE MAINTENANCE

### BETTER...

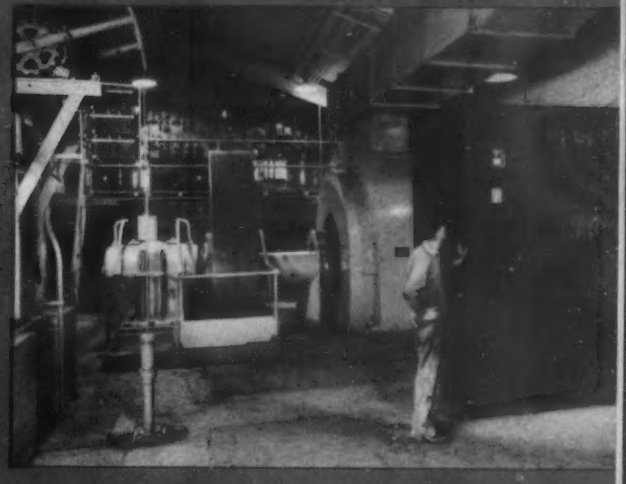
**Control Centers improve operation, increase safety, cut service time . . . . . .** In a large mixing room—where 85 motors drive synchronized conveyers, sand mixers and slingers—a Westinghouse Control Center replaced individual starters. Result: centralized, interlocked control of all operations; greater safety for personnel; important savings in service time on individual operations located 200 ft. or more apart.

**Ignitron Rectifiers can operate automatically and unattended.** With no major moving parts to require maintenance, the Ignitron delivers power continuously, 24 hours a day. Maintenance costs can be reduced as much as 66% by use of Ignitron Rectifiers in place of standard motor-generator sets.

### CHEAPER...



**AB-I Breakers eliminate outage costs.** When an AB-I Breaker interrupts the circuit due to abnormal conditions, service can be restored immediately—there is nothing to replace. In a typical steel mill installation, savings in production, man and machine hours, and replacement costs amount to over $2,000.00 a year.



**$1,500.00 Monthly Savings . . .** effected in this Eastern steel plant by the use of two 1260 kva Capacitors—one unit shown here. Cost of the Capacitors was offset by power savings in eight months time.

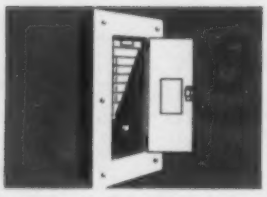
**Westinghouse**

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

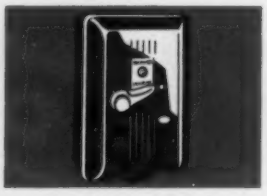
***Here's the complete line of Westinghouse power distribution equipment →***

FOR ANY POWER DISTRIBUTION PROBLEM Westinghouse OFFERS

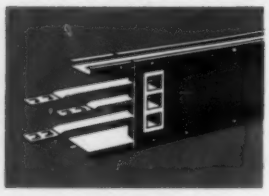
# THE RIGHT EQUIPMENT..APPLICATION HELP



**CONVERTIBLE AB "DE-ION" DISTRIBUTION PANELBOARDS** are available for circuits from 15 to 600 amperes, inclusive; 600 volts a-c, 250 volts d-c.



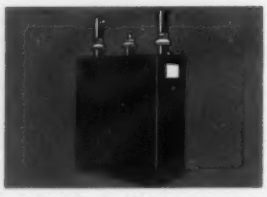
**AB-I BREAKERS** are built in ratings from 15 to 600 amperes at 125 to 250 volts, d-c; 115 to 600 volts a-c. Individually calibrated at factory. Sealed to prevent tampering.



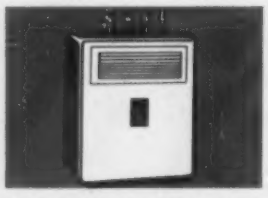
**PLUG-IN BUS DUCT** ranges in capacity from 225 to 1000 amperes, for 2, 3 and 4-conductor applications. Built in 10' lengths, with plug-in openings at 12" intervals.

**POWER CENTERS** are available for voltages up to 15,000, 3-phase, 60-cycle, with capacities of 100 to 2,000 kva, depending upon the voltage.

**CONTROL CENTERS** to handle combinations of: squirrel-cage motors from 1 to 100 hp, three-phase, 220 to 550 v.; unit starters from NEMA sizes 1 through 4.

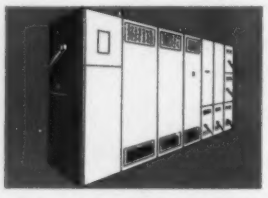


**CAPACITORS** for indoor mounting are built with single or multiple dust-tight covers; small or large racks; 7½ kva, 230 volts to 2520 kva, 13.8 kv.



**ASL AIR-COOLED TRANSFORMERS** are built in single and three-phase designs, rated from 150 to 500 kva, 2400 to 15,000 volts.

**SAFETY SWITCHES** are built in a wide range of models for ratings of 120, 240 and 575 volts a-c; 125, 250 and 600 volts d-c; 30 to 1200 amperes.



**AIR-COOLED NETWORK SYSTEM UNITS**—capacities of 300, 500, 750 and 1000 kva for high voltages from 2300 to 13,800 and low voltages of 125/216 (4-wire).

### APPLICATION ENGINEERING

The how-to-do-it ability of Westinghouse engineers is available at any time to help solve power problems in your plant. This application engineering service applies the broad electrical and production experience gained in many fields of industry to your specific problems. Just contact your nearby Westinghouse office, and a competent engineer will call.

### RESEARCH

The scope of Westinghouse research reaches into every industry. Wherever power is used and distributed, this research has played an important role in doing jobs better, faster, cheaper. Westinghouse research facilities are available at any time to help you use new production tools and apply scientific knowledge in finding practical solutions to production problems.

### TRAINING MATERIAL

Westinghouse training material includes not only instruction courses in such subjects as electronics and resistance welding, but everyday help in all phases of the operation and maintenance of modern electrical equipment. This help is available in the form of printed literature and training films. Ask your nearest Westinghouse office to show you samples of this material.

### MAINTENANCE

A nationwide chain of 34 Westinghouse Manufacturing and Repair Plants offers speedy, effective help on all types of electrical service and repair. A skilled corps of specialists, on call through your nearby Westinghouse office, is ready to help you at any time.

### RENEWAL PARTS

Parts warehouses in 29 cities carry complete stocks of genuine Westinghouse renewal parts. Westinghouse distributors—in addition to their own stocks—can secure parts promptly from warehouse or factory stocks.

*Mail coupon for more information*

Westinghouse Electric Corporation
P. O. Box 868, Pittsburgh 30, Pa.

Please send me more information on the following products:

| | | |
|---|---|---|
| ____Panelboards | ____Power Centers | ____ASL Transformers |
| ____AB-I Breakers | ____Control Centers | ____Safety Switches |
| ____Bus Duct | ____Capacitors | ____Network Units |
| ____Lighting | | ____Ignitron Rectifiers |

Name_____ Company_____

Title_____

Address_____ City_____ State_____

J-90570

**PRODUCTIVE POWER**

*Litho in U.S.A.*

## Interrupted Quenching

(*Continued from Page 79*)

not parallel to the first curve, followed a similar pattern and by plotting these two curves on one sheet, the appearance is that of a broad letter "s". This so-called "s-curve" diagram therefore summarizes the tests for a particular steel, in condensed form, and depicts the time required for the breakdown of austenite to ferrite and carbide at any constant temperature below the equilibrium transformation range. It is of particular note that at the nose of the curve the time interval from quench to start of transformation is very small, although it varies considerably with steels of different analyses.

Similar tests have been made on a great number of steels, including the alloy steels, and from the resulting curves the following observations can be made: To the left of the first curve, the steel is austenitic. Between the curves the structure is a mixture of austenite and the various end products, which range from pearlite, at the higher temperatures, through sorbite and troosite, to martensite, at the lower temperatures. To the right of the second curve where transformation is complete, the structure is composed of the end products. It is significant that in the range between 400° to 800° F, approximately, the end product from this isothermal transformation seems to be new and different in that it possesses an unexpected degree of toughness and ductility at relatively high levels of hardness, particularly in carbon steels. This product is known as bainite.

Further investigation of these facts has led to the development of a new method of heat treatment based upon isothermal transformation in this temperature range. This process is commonly known as austempering.

**Austempering:** Austempering is an interrupted quench consisting of quenching steel in a molten bath—usually salt—maintained at a constant temperature at some point between 400 and 800° F (usually toward the upper level of this range, which reduces the time required for transformation). The austenite transforms isothermally into bainite or intermediate structure. This process is used to attain hardnesses of C-48 to C-55, along with added desirable characteristics of toughness and ductility.

However, for many types of steels the holding time in the bath at desirable temperature is extremely long, which makes the process impractical commercially. Tests also indicate that the high quenching temperature required for some steels retards the

Pre-coated Thomas Cold Rolled Strip Steel is used throughout industry because of its cost-cutting features and its adaptability to many applications. Share our experience in working out new production short cuts.

**THE THOMAS STEEL CO.**
**WARREN · OHIO**

Thomas Strip
COLD ROLLED STRIP STEEL
REG. U. S. PAT. OFF.

Electro-coated Zinc, Copper, Nickel and Brass . . . Hot Dipped Tin and Solder . . . Lacquer Coated in Colors . . . Uncoated Precision Strip . . . Carbon and Alloy Specialties

cooling action sufficiently so that the cooling curve crosses the nose of the "s" curve and the result is a mixed microstructure (usually containing primary ferrite), a structure having low physical properties. For these reasons, austempering is limited to steel parts of small section and of certain analyses.

**Isothermal Quenching:** As mentioned above under austempering, where the quenching operation is carried out at a temperature in the neighborhood of 800° F, it is difficult, and in many cases impossible, to get by the nose of the "s" curve. This condition is of course, very much aggravated with heavier sections. An examination of the "s" curve diagram will reveal that austempering, at the lower temperatures, will require considerable length of time, which, in the case of most alloy steels, might run into days. This method is, therefore, limited to small parts and those steel analyses which permit the operation to be completed in a reasonable length of time. The isothermal quench circumvents these difficulties in the following manner:

Part is quenched to a lower temperature which gets the operation by the nose of the "s" curve. Then, instead of completing the transformation at this temperature, which entails a long period of time, the part is removed from the first quenching bath, after a predetermined time interval, and placed in another bath at a higher temperature. An examination of the "s" curve will reveal that this will materially decrease the time required for transformation.

Another explanation that has been suggested is that the isothermal quench is a combination of an interrupted quench and a drawing operation. However, the former explanation is probably the better because the latter is liable to introduce some confusion in that it more nearly fits the procedure in martempering.

**Martempering:** This is interrupted quenching, which is a more radical departure from the austempering method than is the case with the isothermal quench. At this point it should be again mentioned that approximately at the lower bulge towards the right in the lefthand curve is a point designated as the Ms point at which martensite begins to form.

Martempering consists of quenching in a molten salt bath maintained at a temperature slightly above this Ms point and held there until the temperature has equalized throughout the entire cross section, but not long enough for isothermal transformation to commence. It is then removed from the bath and cools slowly in air. Austenite thereupon transforms into martensite at a more or less uniform rate throughout the cross section of the steel, thus avoiding excessive residual strains.

After cooling, the part is subjected to whatever tempering or drawing treatment is indicated to produce the physical properties and metallurgical constituents required. A simple way to think of martempering is to consider it as the normal quenching and drawing operation, plus the introduction of an interruption in the cooling cycle at the proper point to permit equalization of temperatures throughout the piece before the transformation from austenite to martensite begins.

**Furnace Equipment:** Because of the temperatures involved and the necessity for rapid cooling to the quenching temperature, salt baths are used as the quenching media for these operations.

Pot furnaces for salt quenching must be maintained at a constant temperature, irrespective of the rate at which they are operated, and therefore capable of meeting three distinctly different operating conditions:

1. Salt must be melted and the bath brought to temperature when originally charged or after a shut-down. This stage requires a high rate of heat input.
2. The salt bath must be maintained at temperature during stand-by period. This requires a low rate of heat input, merely sufficient to make up for normal radiation.
3. During quenching the heat introduced into the quench salt by the hot steel will quickly increase its temperature. Therefore, a means of rapid heat removal must be provided.

To meet these conditions a very successful design of pot quench furnace has gas fired, suction type, immersion burners, with heating tubes inside the pot directly in contact with the salt. At the inlet end of each heating tube is an inspirator and pilot-ed gas burner. At the outlet end is an eductor or exhaust fan to draw the products of combustion from the tube, and to provide sufficient additional suction to draw a large portion of the air for combustion into the inlet end.

About 40 per cent of the required air is mixed with gas in the inspirator and the remainder is drawn into the tube around the burner as secondary air. As the gas and air continue through the tube in parallel streams they gradually diffuse into each other and burn. This provides a uniform heat output along the entire length of the tube, irrespective of the number of bends required to comform to the pot's contour.

During quenching periods, when heat must be rapidly extracted from the salt, the gas supply to the heating tubes can be manually or automatically shut off. The eductors (or an exhaust fan) continue to operate, and usually will draw sufficient cold air through the tubes to remove the required amount of heat. If necessary, provision can be made to force additional air through the cooling tubes to increase the quenching capacity of the bath.

For relatively low production rates a small draw furnace of the pot type, with low-pressure automatic proportioning gas burners, may be used. (With this firing system air under pressure inspirates the proper quantity of gas for combustion.) During quenching periods the gas supply may be shut off and the air normally required for combustion allowed to circulate through the furnace setting.

According to Arnold P. Seasholtz in *Metal Progress,* Oct. 1944, p. 730, the electrically heated pots are provided with motor-driven, propeller type agitators and the absorbed heat is dissipated by forced air circulating through a welded steel jacket around the salt quench pot.

Without air cooling, the only way heat can be dissipated is by normal radiation. The amount of heat so radiated will depend upon the dimensions of the pot, the ratio of pot depth to its diameter or width, and the insulation provided in the furnace setting. This amount of heat dissipation is not adequate for production jobs.

Theoretically, it appears possible to increase the rate of quenching by installing additional cooling coils in the salt bath. Two of the earlier installations equipped with suction immersion burners also included such additional cooling coils. However, in actual operation they have never been required.

Air rather than water is recommended as the cooling medium. If a water coil should leak or break when immersed in molten salt, the resulting shower of scalding salt is hard to contemplate.

Temperature can be easily controlled, automatically, either in the immersion burner or externally fired pot quench furnaces. A gas valve controlled by the temperature of the salt bath is all that is necessary. When the desired temperature is attained the gas supply is shut off and the air, normally used for combustion,

AFTER nine years of the hardest kind of service, here is a garbage truck still in excellent condition. Its body is high-tensile steel.

Previously, New York City's garbage trucks were built with carbon steel bodies. Usually they had to be repaired every 6 to 12 months. To eliminate this condition high-tensile corrosion resisting steel was specified. These ran for years without repairs, and since then repairs have been minor--confined to replacement of bottom parts worn out by abrasion. There have been no failures due to corrosion.

Yoloy is Youngstown's nickel-copper low-alloy steel. Its corrosion-resistant characteristics are outstanding. It is also unusually tough and strong, with excellent welding properties. This makes Yoloy ideal for construction where it is important to reduce dead weight, and where long, trouble-free service, even under adverse conditions, is important.

Yoloy, Youngstown's high-tensile steel, is produced in plates, sheets, strip, bars, shapes, seamless and electric weld pipe.

Acids, moisture and other corrosive matter have not seriously affected the high-tensile steel garbage truck body shown above.

QUALITY
TRADE MARK
YOUNGSTOWN
SERVICE

**YOUNGSTOWN**

**THE YOUNGSTOWN SHEET AND TUBE COMPANY**

GENERAL OFFICES - YOUNGSTOWN 1, OHIO

Export Offices - 500 Fifth Avenue, New York City

Manufacturers of

CARBON - ALLOY AND YOLOY STEELS

Sheets - Plates - Pipe and Tubular Products - Bars - Rods - Wire - Cold Drawn Carbon Steel Rounds - Tie Plates and Spikes - Conduit - Electrolytic Tin Plate - Coke Tin Plate.

# Work Sheet For Sheet Metal Workers

## In Stock Reynolds Utility Aluminum

BENJAMIN WOLFF & COMPANY
PRIME METAL SERVICE
CHICAGO

**All of the sheets you want for work**
**in the sheet sizes you want to work**
**with the machinery you now have at work**

Here, too, Aluminum corrugated sheets in stock.

In a phrase, Reynolds Utility Aluminum meets galvanized steel on a competitive level—including price. You can have all you want—*now*. For full information, without obligation, phone Republic 9100, or write,

**BENJAMIN WOLFF AND COMPANY**

General Office and Warehouse—5800 South Seeley Ave., Chicago 36, Ill.

Wisconsin Office — 176 W. Wisconsin Ave., Milwaukee 3, Wis.

continues to flow through the burner equipment. When the temperature falls below the desired point the gas is again turned on.

From Information Letter No. 10, Industrial and Commercial Gas Section, American Gas Association, New York.

## Welding and Cutting

(*Continued from Page 84*)

mounted on a cutting machine carriage operating on a straight track. Parts of the weldment are held in a jig parallel to the machine track. The control box for the welding head is in the left foreground, and in front of that is the vacuum melt recovery unit.

Yoke arms are then incorporated into the final assembly, as can be seen in Fig. 13. In this jig four subassemblies—the two yoke arms, a head cross box beam, and the vertical hub—are assembled. Vertical hub casting is about the only item in these assemblies that is not a fabricated steel part. The cross box and horn down to the cast hub is used as the fuel tank.

A scraper is connected to its 2 wheeled tractor unit by means of a king pin operating in the vertical hub. Universal motion is obtained by a rocker connection between the king pin and the frame of the tractor unit. The king pin rocker housing has two supporting members. These are cut from 3/4-in. plate, and are fitted, cross-braced and tack-welded. They are then placed on a small rotating positioner and the four corner welds are made. In the actual welding operation, the melt is retained on the corner being welded by a light wooden frame lined with asbestos rope. The weld is made in a single pass, using about 700 amp dc, and 36 v. A welding speed of 6 in. per min is obtained. Joints are prepared with approximately 3/16-in. overlap at the corner and have a manual backing bead.

King pin itself is forged from 4140 steel, and welded to a mild steel bearing plate 3 in. thick. Principal purpose of this bearing plate is to provide mild steel for good weldability in attaching the ears through which the rocker pin passes. Before welding, the parts are rough-machined to form the joint preparation.

Bearing ring and pin are pressed together and preheated in a furnace at 400° F. The assembly is then placed in the fixture shown in Fig. 12 which is rotated by means of the motor-driven positioner on which it is mounted. The same fixture is used for making welds on the other side in accordance with a predetermined se-

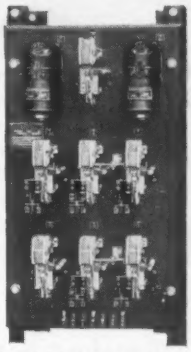
*Many Cranes Can Be Controlled to Advantage from the Floor*

THIS EC&M Control for **floor-operated** cranes has all the advantages of the well known EC&M Control for **cab-operated** cranes. A single pendant master-station, with two Push Buttons for each motion, makes possible the control of all crane movements. Individual rope-operated Master Switches can be had if desired.

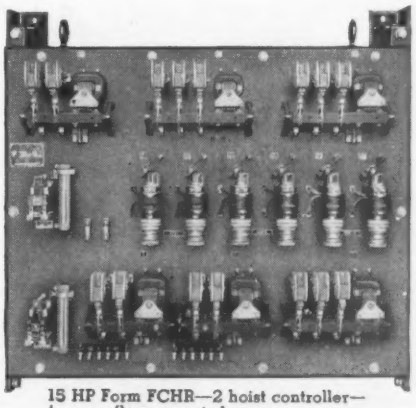
Among the advantages of this standardized line of controllers are (1) accurate inching, (2) compact mounting, and (3) minimum collector-bar requirements. They can be conveniently installed along the crane girders or mounted on the trolley.

Resistors are carefully proportioned for low-torque hoisting of light loads and also provide smooth acceleration for bridge and trolley.

● Send for Bulletins 922 (D.C.) and 931 (A.C.) which illustrate and completely describe these units.



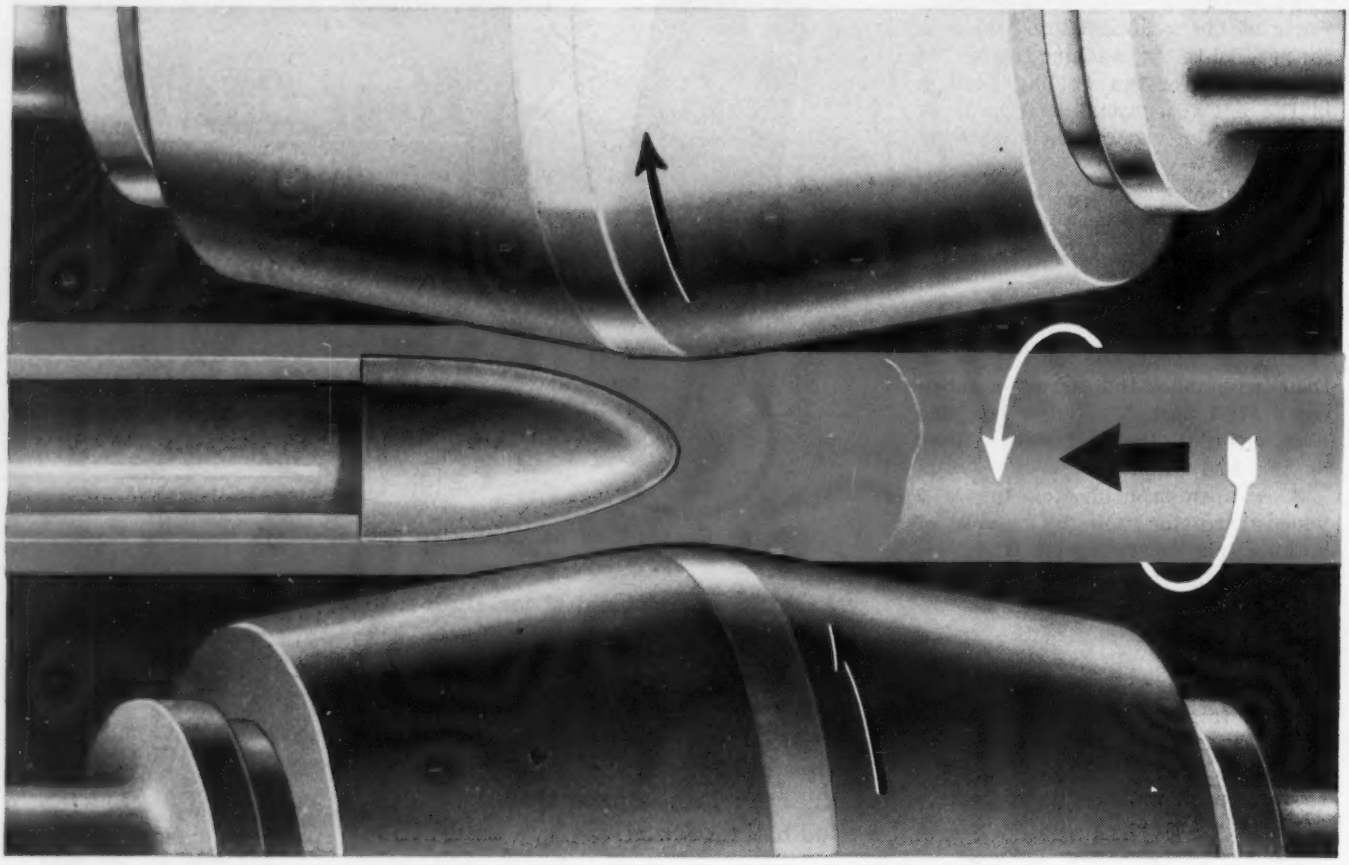
Form FCR Controller for trolley or bridge motion —for direct current floor-operated cranes.



15 HP Form FCHR—2 hoist controller—for a.c. floor-operated crane.

**THE ELECTRIC CONTROLLER & MFG. CO.**
2698 EAST 79th STREET • CLEVELAND 4, OHIO

# What you should FINE FORGED QUALITY OF



If you make a hollow cylindrical part and want to get top quality without paying top cost, here are a few things you should know about the uniform fine forged quality of Timken seamless fine alloy steel tubing.

**1 MANUFACTURING PROCESS REVEALS REASONS FOR FORGED QUALITY.** Timken seamless tubing gives you forged qualities because the piercing process by which it is made is basically a forging operation.

Billets, heated to proper piercing temperature, are worked between the rolls and forced over the piercing point with a spiral kneading action that thoroughly works the metal from the inside, from the outside, and throughout the entire cross section. The billet is pierced at the rate of a foot a second. No time for heat loss. Every inch of the tube is wrought at the same ideal temperature.

**2 THREE OUTSTANDING ADVANTAGES.** The tremendous displacement of metal due to the forging action of the piercing operation results in these outstanding advantages:

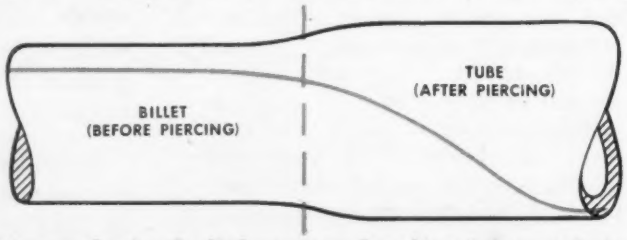



*Diagram showing the displacement and working of the steel during piercing operation. Straight score mark placed on billet for test purposes is twisted during piercing as shown by red line.*

*Improved Grain Flow.* Timken seamless tubing has a definite fiber-like structure, with uniform grain flow. Red line in diagram shows how piercing results in a spiral grain flow, which makes for greater strength and toughness in your product.

# know about the TIMKEN SEAMLESS TUBING

*Refined Grain Structure.* Large crystals are "refined" into smaller grains, which brings out the best in the quality of the metal.

*Uniformity.* Due to the speed of the forging action, every inch of a Timken seamless tube possesses uniform physical characteristics. And close control of every manufacturing step, from tube to tube and from heat to heat, further assures dependable, uniform response to your machining and heat treating operations.

Because Timken tubing can be inspected on the inside surface as well as on the outside, your scrap losses are reduced—waste of machining time avoided.

**3 PROVED IN TESTS.** Is your product headed for tough service? In comparing Timken seamless tubing to bar stock, tensile tests on quarter-section tangential transverse specimens prove that the piercing action results in an improvement of approximately 60% in elongation and approximately an 80% reduction in area. Here are the figures:

| | ELONGATION IN 2" | REDUCTION IN AREA |
|---|---|---|
| **Billet** (before piercing) | 7.4% | 16.7% |
| **Tube** (after piercing) | 11.7% | 30.1% |

**4 PROVED IN SERVICE.** For use in heavy gun barrels, steel has to be *better* than good! Made from Timken seamless tubing, 37 mm to 105mm gun barrels used during World War II cost 50% less than those made by other methods, and *stood up far better.* About 90,000 of these gun tubes were manufactured by Timken. Many of them were used in guns of unusually high velocity. But Timken seamless tubing proved so uniform that not a single gun fragmented in service—or when burst in proof test (see above).

**5 CAN THIS OUTSTANDING SEAMLESS TUBING HELP YOUR PRODUCT?** If you think your product might benefit, quality-wise or cost-wise, from Timken seamless tubing, let the Timken Technical Staff make an "on-the-job" analysis of your problem. They'll tell you, without obligation, whether the fine forged quality of Timken seamless tubing can . . . or can't . . . meet the service requirements of your product and save you money. Write Steel and Tube Division, The Timken Roller Bearing Company, Canton 6, Ohio.

**YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH**

*Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.*

Look to Medart for...
COLD FINISHING MACHINES
Look to Medart . . . because Medart makes every type: Straightening and Turning Machines . . . billet peelers . . . bar centerers . . . bar pointers, etc. Installations throughout the entire metal industry attest their excellence and many long years of service. Medart cold finishing machines are used for working all types of metals.
NO. 4 SIZE MEDART TYPE HF BILLET PEELER
NO. 3 SIZE TYPE LS HEXAGON, FLAT AND SQUARE STRAIGHTENING MACHINE
NO. 4 SIZE MEDART CENTERLESS AUTOMATIC BAR POINTER
No. 0A SIZE MEDART TWO ROLL SINGLE MOTOR ROTARY STRAIGHTENING, SIZING AND POLISHING MACHINE
MANUFACTURING ENGINEERS OF COMPLETE TRANSMISSION EQUIPMENT AND SPECIALIZED MACHINERY
MEDART
THE MEDART COMPANY - 3500 DE KALB ST., ST. LOUIS, MO.


quence. About 45 min are required to complete the welding.

Box beam shown in Fig. 14 is another interesting subassembly. It is manufactured from two angles by corner welds joining the legs. This particular illustration is interesting because it shows in detail the melt retainers made of strips of wood faced with asbestos rope. The retainers are held in place by wedges and clips tack-welded to the beam.

Remarkable records made by some of the shipyards during the war can be largely attributed to the fact that these yards were laid out for welded ship fabrication instead of being adapted to that purpose, as was the case with some of the already established yards. The flow of raw materials to subassembly points and of the subassemblies to the final assembly station is as important in a manufacturing plant as it is in a shipyard, and it is one of the principal factors in effecting the efficiency of the operation. Wherever possible, in the plant, straight line flow with a minimum of back-tracking is provided.

Material from the stockpile which consists of tubes, channels, H-beams, steel shapes and sheet steel all progresses from this point into the shears or into the cutting tables. After cutting, some of the sheet parts are formed by a large press just back of the shear.

An important factor in the efficiency of mechanized welding and cutting operations is an adequate and convenient supply of the gases and other materials required. Acetylene is produced by the two 300-lb acetylene generators and is delivered by a pipeline to stations throughout the plant. Oxygen is supplied from a Cascade oxygen storage unit.

---

From a presentation made at the Western Metal Congress, Oakland, Calif., March 26, 1947.

## Nickel Steel Properties Presented in Paper

Description of the development of an 8½-per cent nickel steel which is resistant to the embrittling effect of low temperature and which may be fabricated under many of the same conditions associated with structural steel was the basis of a paper presented before a recent meeting of the Petroleum Committee of American Society of Mechanical Engineers in Houston, Texas.

Given by T. N. Armstrong and G. R. Brophy, both of International Nickel Co. Inc., New York, it covered effect of variations in chemical composition, tensile and impact properties.

# For Lower Cost use Die Castings

*Because* **DIE CASTING** is the shortest route from raw material to finished part.

*Because* liquid metal is fed in one end of the casting machine and within a few seconds, the other end delivers a finished casting practically ready to use.

*Because* **DIE CASTINGS** are produced in zinc—aluminum—magnesium—brass—tin—lead alloys, whichever most economically and functionally meets your needs. Castings can be finished by us in nickel—chrome—copper—enamel and paints of all colors.

*Because* our plants at:

are strategically located to serve your plants in close proximity.

## DOEHLER-JARVIS CORPORATION

*The World's Largest Producer and Finisher of Die Castings*

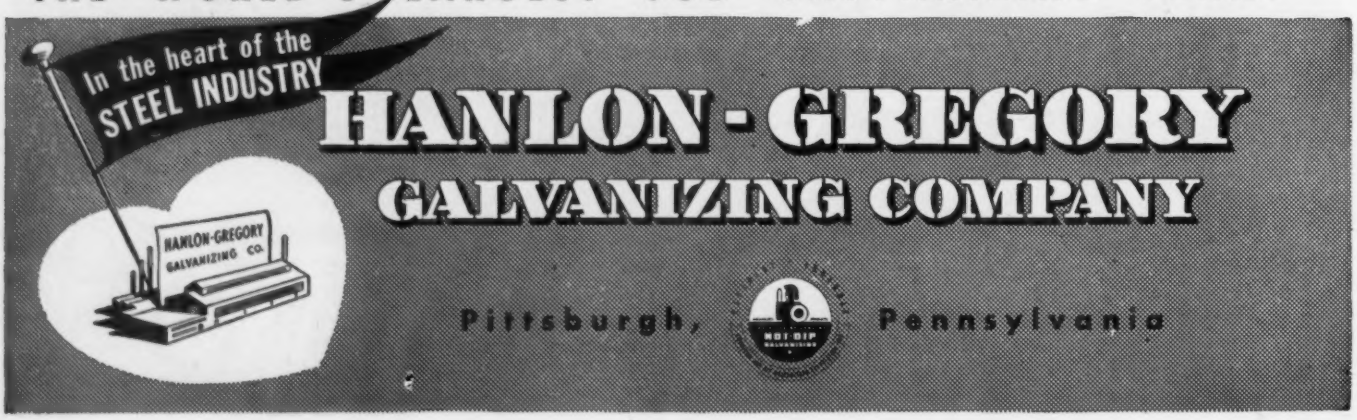
Executive Office
386 FOURTH AVENUE
NEW YORK 16, N.Y.

# Hot-Dip
## Galvanized Bridge Railing
## *Lasts Longest*

YEARS and YEARS of service are added to the life of bridge railings and other exposed installations that are Hot-Dip Galvanized by the Hanlon-Gregory process. This method of fusing base metal with molten zinc is your solution to expensive maintenance problems.

The World's Largest Job Galvanizing Plant, in the very heart of the steel industry, is prepared to provide the *best proven prevention* against rust—for your products—in any quantity.

**THE WORLD'S LARGEST JOB GALVANIZING PLANT**



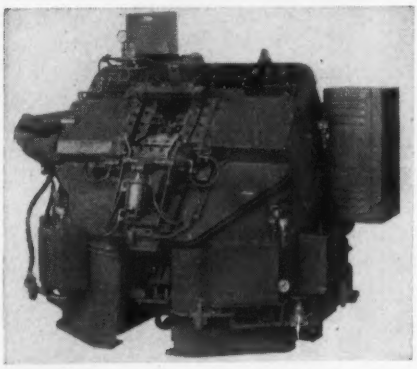
# New Products and Equipment

*Additional information on the new products and equipment described on this and succeeding pages may be obtained, without obligation, by checking appropriate numbers on the cards following page 122*

## 1. Projection Welder

Using one semiskilled operator, a new projection welder announced by Federal Machine & Welder Co., Warren, O., is capable of producing approximately 200 completed assemblies per hour. Of stress relieved, welded steel construction, the machine assures maximum rigidity during the continuous high production rate.

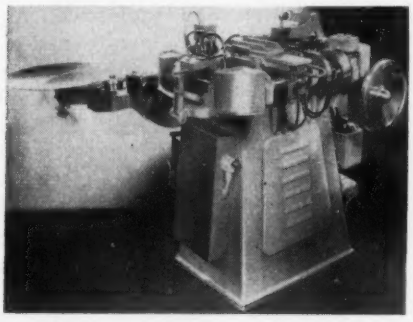
In order to facilitate loading of pressed steel parts and unloading



of completed welded assemblies, the mandrel and head are mounted in an angular position. Dies, which have alloy inserts to coincide with the projections on the work pieces, are designed to insure an ample flow of water for cooling. Two small air operated hold down clamps act as auxiliary clamping unit and position the work during sequence of welds.

## 2. Punch Press

Designed for high speed production of small formed stampings from coil stock, the No. 11 Multi-Slide punch press, made by U. S. Tool Co. Inc., East Orange, N. J., is capable of oper-

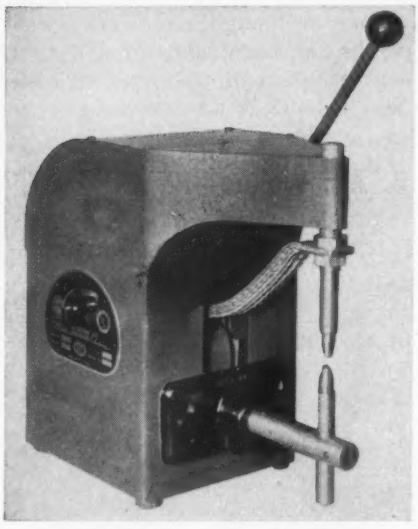


ation at speeds up to 500 strokes per minute. Stock ¾-inch wide can be accommodated.

Maximum length of feed obtainable at each stroke is 3 inches, feed length being adjustable from 0 to 3 inches. Although 1/32-inch is the maximum thickness of stock which may be handled in most cases, thicker stock may be used on certain parts. Machine is powered by a 1 horsepower motor and has automatic lubrication and variable speed drive.

## 3. Spot Welder

Plugging into any standard outlet carrying 110 volt alternating current is the only operation necessary to prepare the 1 kilovolt-ampere junior spot welder, made by Rex Welder & Engineering Co., Kansas City, Mo.,



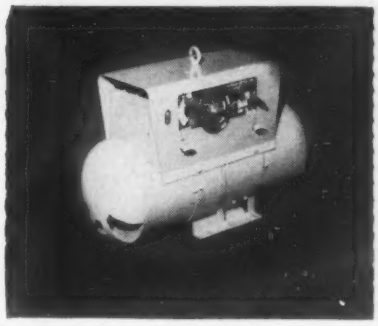
for use. It has an air cooled transformer, removable standard No. 1 Morse taper tips and welds up to 24 gage mild steel.

Operation is controlled by a hand lever on the right side of the welder but a foot operated attachment may be provided. Throat depth is 6 inches and the lower horn is adjustable. It stands 14 inches high and weighs 76 pounds. The same welder can be supplied with a 220 volt transformer.

## 4. Arc Welding Machines

Heavy duty single operator direct current arc welding machines, designated as type WD-40 series by their manufacturer, the General Electric Co., Schenectady 5, N. Y., are designed for improved welding characteristics and a 50 per cent saving in overall size and weight. Operating at 3500 revolutions per minute, they are offered in 200, 300 and 400 ampere NEMA ratings.

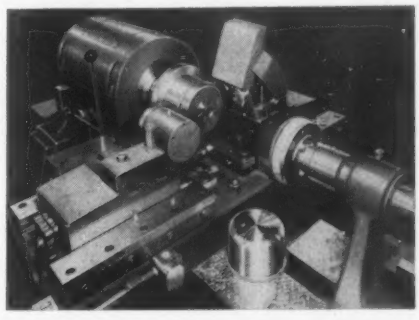
Arc is easily established and maintained as more than full arc voltage is generated instantly after short circuit, largely eliminating arc pop-out. Excessive weld spatter is reduced be-



cause current peaks are adjusted for best performance on any setting. A single dial, dual control makes it possible for the operator to preset correct current for any given job without having to make other adjustments after the arc is struck.

## 5. Cross Slide Attachment

Designed by E. W. Bliss Co., 450 Amsterdam, Detroit 2, Mich., an independently operated hydraulic cross slide attachment is intended for No. 15 and 16 second operation spinning lathes made by that company. Constructed to eliminate operator fatigue, increase production and insure



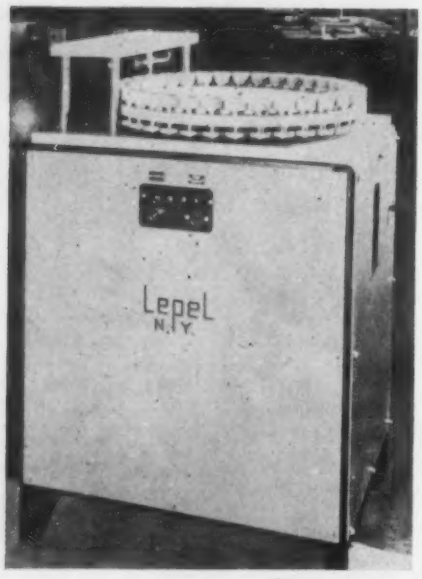
part consistency in trimming, beading, curling or wire rolling operations, the entire operation of the slide is arranged in an automatic cycle with push button starter. All strokes and positions of the slide are controlled by adjustable dogs.

Attachment may be removed when

desired. Its power system includes speed and feed adjustment. Lathes are designed to supplement drawing presses by performing rapid secondary operations such as trimming, bulging, necking, beading, wiring, flanging and curling of press-drawn or spun shells.

## 6. Heating Turntable

An improved automatic turntable for continuous soldering, brazing and annealing of small ferrous and nonferrous parts is being manufactured by Lepel High Frequency Laboratories Inc., 39 West 60th St., New



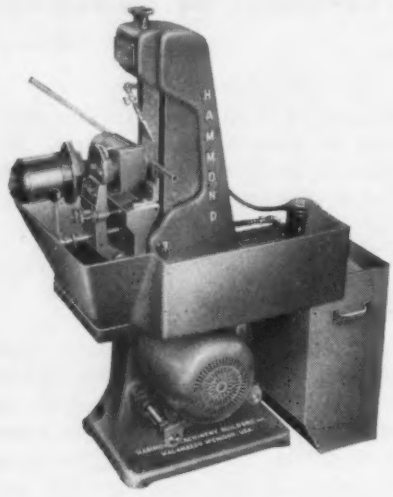

York 23, N. Y. Table uses small cup-like receptacles in which part to be treated is placed. These receptacles simplify positioning and therefore assure uniform heating.

Table operates from any 115 volt, 60 cycle current source, and is powered by a ¼-horsepower motor. Speed may be varied from ½ to 3 revolutions per minute. Receptacles automatically revolve as part is being heated. Any heating temperature is easily obtained on a production line basis and as many as 68 parts per minute may be processed.

## 7. Grinder-Polisher

Known as the OD-1 cylindrical grinder-polisher for rods, bars and tubes, the new machine announced by Hammond Machinery Builders Inc., Kalamazoo 54, Mich., will handle these items in diameters from 1/8 to 1¼-inches. It is a centerless machine using coated abrasive belts. For stock removal it will remove up to 0.005-inch on ferrous metals and up to 0.010-inch on nonferrous.

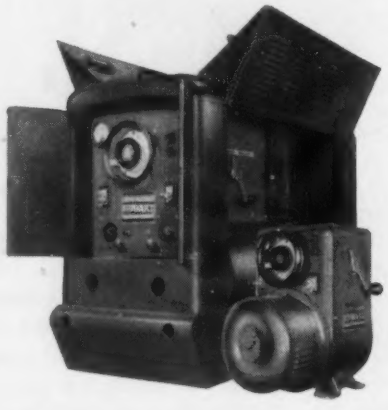
Work supports handle ½-inch bars up to 18 feet long and 1 inch bars up to 8 feet long. Accuracy is 0.001-inch on production items. The endless abrasive belt is 4 inches wide, 60 inches long and may be operated dry or wet with coolant. Through-feed and in-feed methods are em-




ployed, the former being generally used by swinging the regulating wheel on its horizontal axis from 0 to 12 degrees. Rate of feed may be varied from 0 to 18 feet per minute.

## 8. Arc Welder—Power Unit

A 200 ampere rotary alternating current arc welder which includes a switch to convert the welder generator into a 52 ampere, 120 volt, 60 cycle, 5 kilowatt, 6.3 kilovolt-ampere



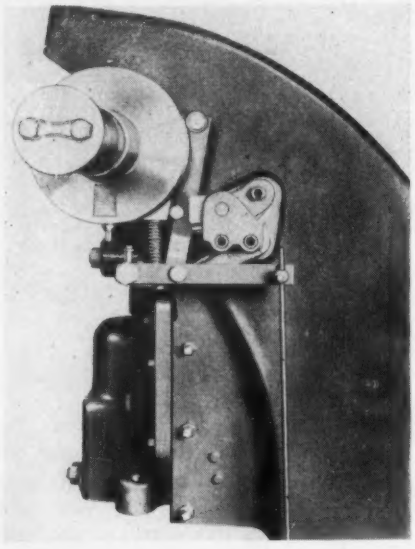
single phase power unit is announced by Hobart Bros. Co., Hobart Square, Troy, O. As an alternating current power unit it will operate fifty 100 watt bulbs (or their equivalent) regularly or as an emergency power source. Operation of electric motor driven equipment also is possible.

Unit is compact and light in weight; the single generator, powered by a gasoline engine, tractor, line belt or jeep power take-off is made to do all the jobs. It enables the operator to weld and use power tools alternately from the same power source. Photo shows the generator unit at right and gasoline engine driven model at left.

## 9. Press Clutch

Federal Press Co., Elkhart, Ind., announces a nonrepeat clutch mechanism on its entire line of open back inclinable presses. This clutch insures single stroke operation regardless of how quickly foot pedal is depressed or how long operator holds pedal in depressed position.

With the new mechanism, the op-



erator need not move from working position or use any tools to adjust machine from single to automatic cycle or reverse. Only action required is to give positive control bolt a one-quarter turn. Clutch provides one complete cycle and stop before press can be retripped in single cycle action. It is available on all Federal presses from 6 to 80 tons.

## 10. Broaching Machines

Both pull-up and pull-down machines as well as single ram surface machines are included in the three new broaching machine lines announced by Colonial Broach Co., Box 37, Harper Station, Detroit 13, Mich. All machines are of the vertical type and are offered in a range of standard tonnages and strokes.

All of the machines have a new hydraulic system layout. Hydraulic pumps are mounted outside machine housing, accessible for adjustment, inspection or service. An air circulation system cools motors and hydraulic systems. Valves are gasket mounted with pressure seals so that any unit may be removed without disturbing piping or draining system.

A hand pump is provided for quick-

ly priming the automatic lubrication system if the machine is not used for a long time. All hydraulic controls are mounted in a single cabinet inside the inspection door on one side of the machine. Electric controls are mounted on a single panel on the opposite side.

## 11. Motorized Hand Truck

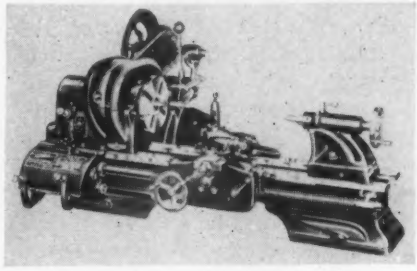
An enlarged bumper guard providing full protective clearance around the working mechanisms is a feature of the Transporter motorized hand truck line made by Automatic Transportation Co., 149 West 87th St., Chicago 20, Ill. Of ½ x 6 in. formed steel plate, the guard will be standard equipment on all units in the line—the Transporter, Transtacker and Transtractor. It is positioned to protect the truck's drive and steering units, yet it leaves those mechanisms easily accessible for maintenance. Turning radius or maneuverability is not affected.

## 12. Die Casting Machine

Simple, compact and very fast in operation, the ADC-56 3-oz cold chamber pressure die casting machine for aluminum alloys, announced by DCMT Sales Corp., 315 Broadway, New York 7, N. Y., utilizes inexpensive single cavity molds. Machine is offered with preheat furnace for premelting aluminum. Metal is injected under high pressure with a pneumatcially operated metal injection plunger.

## 13. Quick Change Lathe

Forty-five threads and feeds are obtained by shifting two levers on the gear box and nine more by changing the position of a sliding gear



on the 10 inch quick change lathe, manufactured by Atlas Press Co., 2395 North Pitcher St., Kalamazoo, Mich. A tumbler gear lever reverses gears or disengages them from the lead screw. The quick change mechanism does not limit odd thread and feed range capacity of the lathe.

By varying the gear train with change gears (extra equipment) hundreds of additional threads and feeds may be obtained. Other features include tapered roller bearings, precision ground bed, 16 spindle speeds, back gears for extra power, instantly reversible power cross and longitudinal feeds and rapid change counter shaft.

## 14. Flame Failure Safeguard

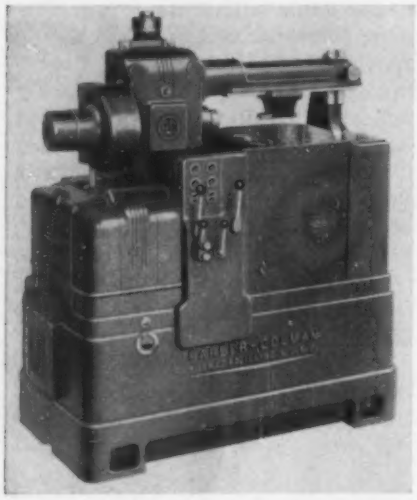
Announced for safeguarding industrial gas ovens, kilns and boilers against flame failure, the Fireye electronic flame rod type 45JQ1, made by Combustion Control Corp., 77 Broadway, Cambridge 42, Mass, is readily applicable to all types of gas fired burners. Used with programming control type 24PJ8 for full automatic burners and control type 24QJ5 when only operating protection is required, the control operates on 115 or 230 v, 50 or 60 cycles and has an ambient temperature range of from 30 to 125° F.

Because the flame control actually "feels" the gas flame, it is regarded as foolproof, instantly cutting off fuel and sounding an alarm (if desired)

when the flame is no longer present. It is easily installed, adaptable to all gas burner heads, immune to moisture and electrical leakage and protected against combustion by-products.

## 15. Hobbing Machine

Features of the No. 8-12 hobbing machine, manufactured by Barber-Colman Co., Rockford, Ill., include semiautomatic cycling, speed for carbide hobbing, conventional and climb hobbing in either direction and rapid traverse in either direction. Machine



is constructed in unit assemblies, with hardened and ground V and flat ways on the horizontal bed and a one-piece overarm, index worm gear case and work slide.

For ordinary jobs, operation is semiautomatic. Once the original setup is made, the operator merely loads and unloads the work and pushes the cycle lever. For high production runs on appropriate parts, the machine is designed to accommodate magazine loading, operation then being entirely automatic.

Machine handles work up to 8 inches in diameter on some pitches and has a hob slide travel of 12 inches. Maximum tooth form which may be hobbed in 10 diametral pitch. Other specifications are: Maximum hob diameter, 2¼ inches; spindle speeds from 150 to 1350 revolutions per minute; and feeds per revolution of work range from 0.005 to 0.400-inch.

## 16. Truck Crane

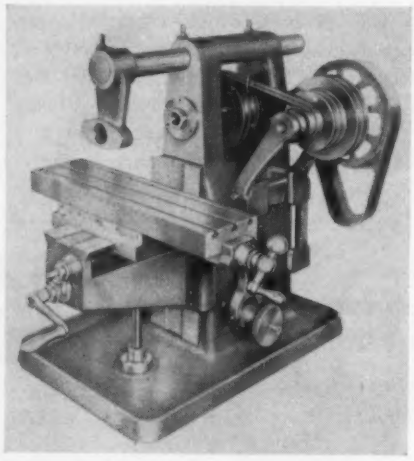
With 50 ft boom folded, the Wagner truck crane, introduced by Mixermobile Manufacturers, 6855 North East Halsey street, Portland 16, Ore., is ready to travel on or off the road, its Chrysler 8-cylinder motor supplying the power. Weighing 41,000 lb and mounted on 10:00 x 20 dual tires, it has a dual drive rear end, hinge type outriggers and a cone-mounted crane capable of 3 to 5 rpm.

It is equipped with oversize clutches and brakes and has standard crane controls. Full view of all operations at all times is possible due to high position of cab. An overdrive on the hoist line provides speedy closing of clam bucket or lifting of light loads.

## 17. Bench Milling Machine

A 4⅛ x 20 inch table, with a 12-inch longitudinal travel, a 9-inch vertical travel and a transverse travel of 6 inches, is incorporated into the design of the model B-12 bench mill, made by Diamond Machine Tool Co., 3429 East Olympic Blvd., Los Angeles 23, Calif. Three table tee slots are provided to mount work.

Heat treated spindle is mounted in tapered roller bearings and is equip-



ped with a No. 9 Brown and Sharpe taper. Spindle nose is hardened and ground. Power is transferred to the spindle by a three-step pulley with double B V-belts. Bracket supporting the jackshaft is arranged for rapid belt shifting and tension adjustment. Speed range of the spindle varies from approximately 100 to 1400 revolutions per minute.

## 18. Safety Valve

Manning, Maxwell & Moore Inc., Bridgeport 2, Conn., is manufacturing a safety valve for air compressors which utilizes a nylon disk. It is also made with a stainless base, cadmium plated cap and spring for use as a relief valve. Use of nylon as a valve seating material is for wear resistance, hardness and flexibility. This disk works against a bronze seat.

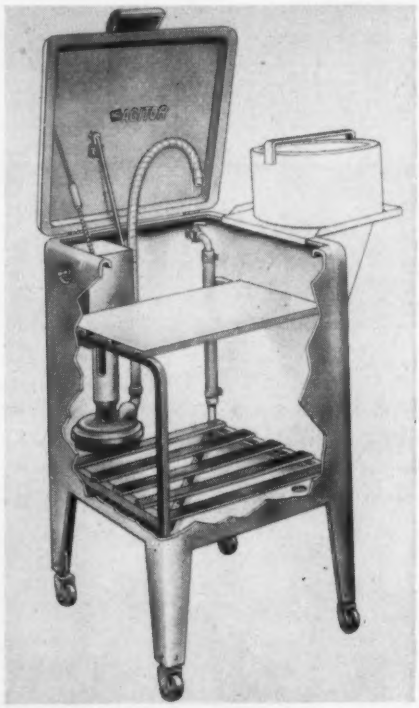
Seat material will not flow or creep under spring compression or stick or weld itself to the seat. It is flexible enough to conform exactly to the seat and has a recovery characteristic which quickly seals off the slightest air leakage after the valve pops.

## 19. Microfilm Machine

Single sheets, magazine articles, pages in bound volumes, labels on bulky packages, etc., may be rapidly microfilmed by the Micro-Record microfilm machine developed by Griscombe Corp., 50 Beekman street, New York 7. Operator need only place the material to be microfilmed on a glass window and touch a single button. Any material may be recorded, providing it is no longer than 9 1/4 x 14 in. Up to 45 exposures per minute can be made with focus, aperture and illumination fixed.

## 20. Parts Cleaner

Measuring 21 in. square with an overall height of 34 in. and a solvent capacity of 24 gal, the model H-83 Agitor parts cleaning system of Gray-Mills Corp., Evanston, Ill.,



combines air agitation and high volume hose cleaning for two-way utility. Unit uses cold solvent which is pumped through a high volume centrifugal pump for flushing out recesses and removing softened grease or for brush-cleaning parts under flowing solvent.

A work shelf to accommodate parts being cleaned is built inside the tank. It slides out of the way to make the entire tank area available for soaking larger parts under air agitation. An improved safety device

incorporating a fuseable fire-link which melts at 165°F is built into the machine. Caster mounting makes the unit portable.

## 21. Scrap Yard Crane

Multiple hinged shoes on the 1020A scrap yard crane, introduced by Unit Crane & Shovel Corp., Milwaukee 14, Wis., are increased in width from 20 to 24 inches; axle also is increased in width as well as in height. Its

elevated magnet fairlead equalizes cable contact on two sheaves, minimizing unnecessary wear.

Hand operated swing lock control is within easy reach of the operator. The boom length can be altered without rereeving the boom hoist cable. Heavier, air cooled double disk clutches and improved automatic traction brakes with sectional linings which are easily replaced without removing the shaft from the machine, are other features. Wider, self equalizing brake bands eliminate dragging and scoring.

## 22. Automatic Sizing Unit

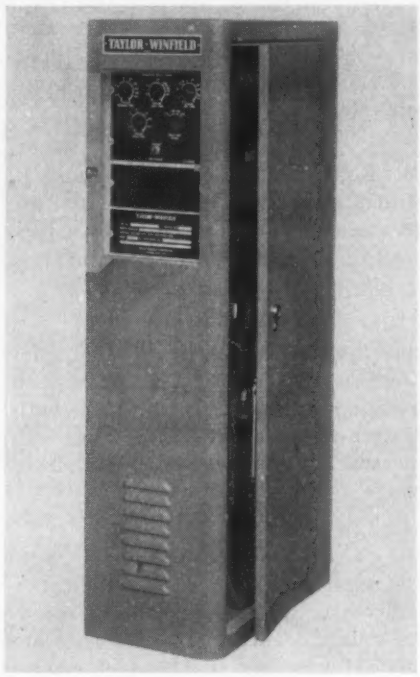
Lathes may be converted from manual to automatic operation for such work as step shaft turning, boring, facing and contour turning, or any combination of them, by an automatic sizing unit developed by Monarch Machine Tool Co., Sidney, O. The new equipment will be available on all 14-in. and larger Monarch engine and toolmaker's lathes.

Addition of the sizing controls does not interfere with the normal functioning of the lathe. Conversion from manual to automatic operation takes about 1 min and setup time varies from 5 to 15 min. Only operator function after conversion and setup is loading and unloading the machine.

Size control is by means of diameter gage blocks, micrometer gage blocks or a template. They are mounted on a rail to the rear of and above the work center line. Controls are mounted on the right end of machine. Separate feed motors supply power for length feed and cross feed.

## 23. Welder Controls

Nonsynchronous welder controls designed for foot, air, motor and hydraulically operated spot, projection, butt and seam resistance welders are being manufactured by Taylor-Winfield Corp., Warren, O. Cabinets have

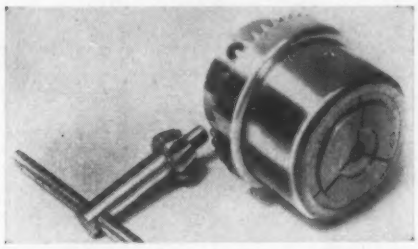



no projecting knobs or handles; they are equipped with safe dead-front panels, easily read graduated dials, drip proof ventilating louvers. Accurate timing is provided by direct current timing circuits which operate on closely regulated bias and timing voltages to compensate for wide variations in power supply voltage.

Control units are accessible through the large side door of cabinet. Panels on which components are mounted swing forward even while in operation. Controls are a complete unit, factory assembled and tested with welder or mounted on welder when so ordered, ready to install with only power, air and water to be connected.

## 24. Small Lathe Chuck

Advantages of the small lathe Bordjaw chuck, marketed by Edward Blake Co., 634 Commonwealth Ave., Newton Centre 59, Mass., are that it does not draw back when closed; only movement is lateral and the chuck can be faced and bored after mounting on the lathe, insuring con-

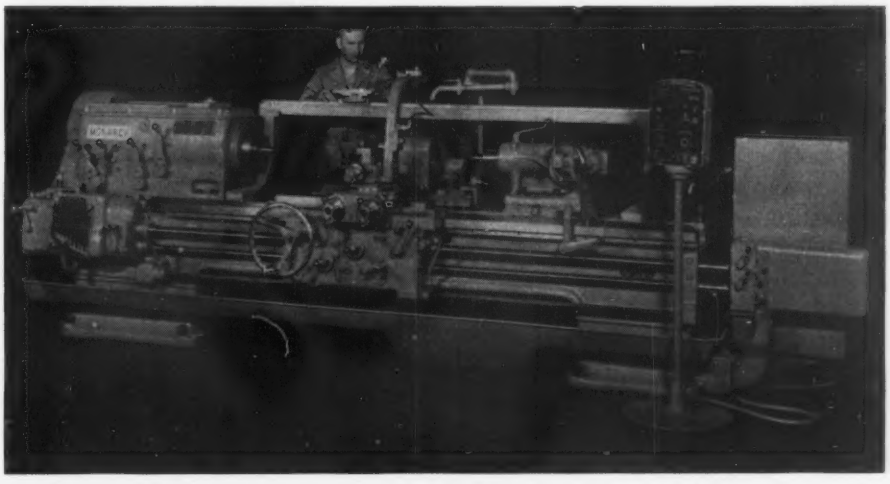


centricity. Jaws can be rebored at any time for any other larger size.

Cast iron boring jaws will take thin pieces or can be machined to hold special shapes. Chuck may be removed from the lathe and replaced without losing accuracy. It is made for lathes having threaded nose spindles 1½-inch-8 thread. Closing ring is operated by a key so that a firm grip can be had when desired.

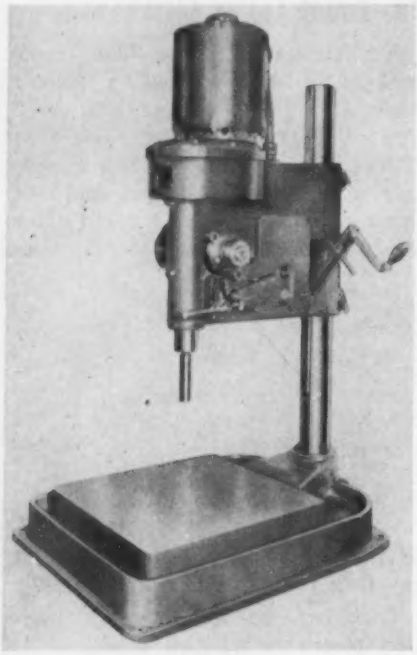
## 25. Tapping Machine

Of compact construction, a new production bench tapping machine, built by Buhr Machine Tool Co., Ann Arbor, Mich., has selective full automatic cycle or hand operation with safety clutch which reduces tap breakage. Change gears make all threads possible in tap diameters from No. 4 to 5/16-inch in cast iron,



or ¼-inch in steel, with class 3 fits under normal conditions. Ball bearing motor is 1/3-horsepower, 1800 revolutions per minute, 3-phase, 220-volt.

Dimensions of machine are: Swing, spindle to column, 10⅞ inches clear; spindle diameter, 1⅝ inches; maxi-



mum vertical travel 2 7/16 inches; base, 17 x 22½ inches with coolant trough. Solid 2¼-inch column may be replaced with one of extra length should clearance under spindle be insufficient.

## 26. Uncoiling Mandrel

An uncoiling mandrel with simple expansion mechanism is announced by Farrel-Birmingham Co. Inc., Ansonia, Conn., for use in rerolling semi-finished metal strip. Expansion is accomplished by the action of a series of longitudinal blades, actuated by

two traversing cones within the mandrel. Operated by a large handwheel on the end of a double screw with threads of opposite hand, cones engage inner surface of blades, pushing them outward so that they grip the inside of the coil. Springs retract blades when cones are backed off.

Mandrel, carried on antifriction bearings mounted in a heavy pedestal, slides on ways in the baseplate and may be moved into or out of position by a rack and pinion mechanism operated by a ratchet wrench. A friction brake provides required back tension.

## DEVELOPED BY . . .

**27.** Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y., EutecTrodes 67 AC and 670 DC for joining, filling, filleting and overlaying all types of steel where high tensile and impact strength, good heat, corrosion and wear-resistance are required.

**28.** Rotor Tool Co., Cleveland, O., MSK-55 gage which shows actual air pressure at the air tool while it is operating. Needle type gage is inserted in air hose while hose is bent.

**29.** Metron Instrument Co., 432 Lincoln St., Denver 9, Colo., low and high speed adapters for use with Metron hand tachometers. They will increase or decrease speed measuring range by factor of 10 to 1.

**30.** Woodworth Specialties Corp., Binghamton, N. Y., a 4-inch indicator-caliper for inside measuring. One of its hollow legs encloses a spring actuated indicator hand which shows slight movements of contact point.

**31.** All-State Welding Alloys Co. Inc., 96 W. Post Rd., White Plains, N. Y., is a 20 per cent silver solder, No. 120, which has a melting temperature of 1430° F and a shear strength of 145,000 pounds per square inch.

**32.** Thomas Laughlin Co., Portland, Me., a replacement swivel hook assembly with a safety latch. Hook is made in ½ and 1 ton sizes with a graphite impregnated bronze washer under nut for easy swivel action.

**33.** Chemco Products Co. Inc., Chicago, Ill., Unisol liquid a paint stripper for wood or metal enameled and painted parts. It will not harm hands or clothing and will not react or affect any metal, glass or wood.

**34.** Millen Mfg. Division, P. O. Box 3911; Detroit 27, Mich., a Foto-Marker for printing identifying numbers on photographic materials. Lever actuated counter has range from 0 to 99,999.

**35.** Herman H. Sticht Co. Inc., 27 Park Place, New York, N. Y., a Minerva Curvimeter, imported from Switzerland, which measures distance accurately by running it along lines of a blueprint or plan.

**36.** Leslie Co., 152 Delafield Ave., Lyndhurst, N. J., new design features for their class DL and DLS diaphragm regulating valves with cooling bonnet for use with air or water operated controllers.

**37.** Dow Chemical Co., Midland, Mich., a corrosion resistant pipe and fittings of steel, Saran plastic lined, for conveying corrosive liquids. Working temperature range is from 0 to 190° F.

**38.** Eronel Industries, 5714 W. Pico Blvd., Los Angeles, Thermo-Dip N.S., a hot melt compound for protecting machine tools, cutting gears, etc. from corrosion, abrasion, shipping hazards, etc. It is easily stripped.

**39.** Air Reduction Sales Co., 60 East 42nd St., New York 17, N. Y., an all-position, mild steel electrode which produces weld metal with good mechanical properties and low hydrogen content. Preheating not required with this No. 312 rod.

**40.** General Scientific Equipment, 27th and Huntingdon Sts., Philadelphia 32, Pa., a manually operated acid pump for use with carboy, drum or barrel. It is offered in hand and foot operated models.

**41.** Super Tool Co., Detroit, Mich., a pocket calculator for computation of speed, feed and horsepower for carbide milling operations.

**42.** Anderson Oil Co. Inc., 548 Brownstone Ave., Portland, Conn., Lusol, a liquid concentrate coolant which is used with 10 to 75 parts of water. Product does not evaporate.

**43.** Owns-Corning Fiberglas Corp., Toledo 1, O., a light weight, high temperature insulating material, offered in felt and bulk form. It is able to withstand temperatures of 1800°F.

**FOR MORE INFORMATION**
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

# Rising Costs Threaten To Force Steel Prices Upward

*Market stability jeopardized by advance in raw materials, especially scrap. Steel mills seek to prevent runaway in scrap by withdrawing as buyers following price jump up to $5 per ton on limited sales in some districts. Pressure for steel deliveries unrelieved. Steel operations pushed to limit*

HIGHER steel prices appear in the making. Market stability is seriously threatened by renewed surge in raw material prices, chiefly scrap. Despite reluctance of producers it seems only a question of time when upward adjustments in price schedules will have to be effected.

Scrap is the bad boy of the markets at the moment with prices up as much as $5 per ton in some consuming districts over the past week or so. Other raw materials also are rising, increased freight rates upping delivered prices all along the line on materials consumed by the steel mills.

Expectations are scrap will rise above the present $43 top paid last week at Pittsburgh and Chicago. Renewed consumer buying resistance, which developed late last week as the large mills withdrew from the market when it appeared scrap was headed for $50 or higher, is not thought likely to materially sap current strength in this market. Steel mill stocks are far from comfortable, and approach of winter, when collections and shipments normally are hindered by adverse weather, reinforces the bullish position of scrap sellers. STEEL's scrap price composite last week rose to a new postwar high of $42.58, jump of $2.83 from the week preceding.

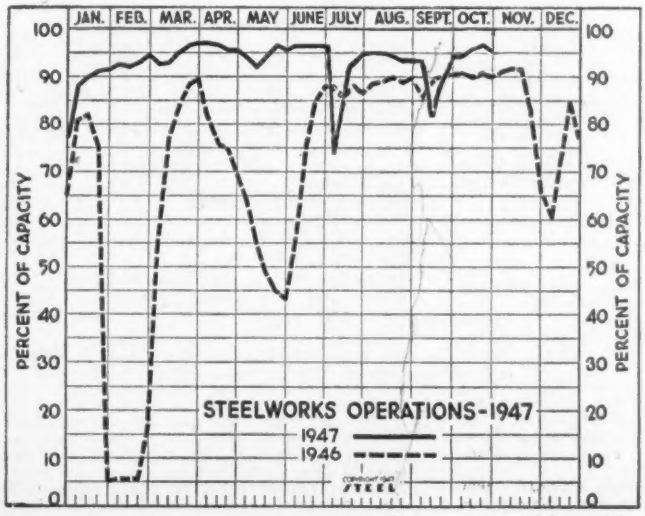
Only substantial offset the mills appear to have to the present strong position of scrap holders is to shut down openhearth furnaces. Such action, it is said, would be taken only as a last resort.

Effect of rising raw material costs, especially scrap, on the steel price structure last week was reflected in the action of one eastern plate mill in advancing prices $6 per ton. Other plate mills held quotations unchanged but they are watching the situation closely and certain smaller independents indicate they soon will have to effect increases if the present trend in raw material costs continues. Substantial increase in the price of tin plate is expected before the end of the year (STEEL, Sept. 8, p. 129). Tin plate was not raised earlier this year because long-term contracts had been entered into at the old prices prior to across-the-board action on steel prices generally.

Pressure for steel is unrelieved. Leading producers expect to open order books shortly for first quarter shipments but indications are actual deliveries in that period will be about on a parity with those in the current quarter. Steel producing and rolling facilities will have undergone substantial expansion by that time, but stringency in raw materials will continue a retarding factor on production, and, moreover, time will be required to get the new production units into full operation.

Steel producers are doing everything possible to push ingot operations to higher levels but indications are they have about reached "the end of their rope in this respect" in view of the shortage of raw materials, and furnace shutdowns for necessary repairs. Last week the national ingot rate eased ½ point to 95.5 per cent, reflecting furnace suspensions for repairs. The operating rate declined 6 points to 74 per cent at St. Louis, 7 points to 87 per cent at Cincinnati, and 2 points to 90 per cent and 86 per cent, respectively, at Cleveland and Detroit. Elsewhere district rates held unchanged from the week preceding.

STEEL's composite price average for steelmaking scrap advanced $2.83 last week to $42.58. This was the fourth consecutive advance in as many weeks. While the finished steel price average held unchanged at $75.41, the undertone of the market was strong. Semifinished steel price composite held at $56.80 and that for steelmaking pig iron unchanged at $36.13.




## DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

| | Week Ended Oct. 25 | Change | Same Week 1946 | Same Week 1945 |
|---|---|---|---|---|
| Pittsburgh | 104 | None | 97.5 | 49.5 |
| Chicago | 95 | None | 91.5 | 72 |
| Eastern Pa. | 91.5 | None | 78 | 71 |
| Youngstown | 92 | None | 91 | 45 |
| Wheeling | 93.5 | None | 93.5 | 80.5 |
| Cleveland | 90 | — 2 | 66 | 81 |
| Buffalo | 88.5 | None | 88.5 | 69.5 |
| Birmingham | 99 | None | 99 | 95 |
| New England | 84 | None | 89 | 80 |
| Cincinnati | 87 | — 7 | 84 | 71 |
| St. Louis | 74 | — 6 | 61 | 68 |
| Detroit | 86 | — 2 | 92 | 88 |
| Estimated national rate | 95.5 | — 0.5 | 90 | 65 |

Based on weekly steelmaking capacity of 1,749,928 net tons for 1947; 1,762,381 net tons for 1946; 1,831,636 tons for 1945.

# COMPOSITE MARKET AVERAGES

| | Oct. 25 | Oct. 18 | Oct. 11 | One Month Ago Sept., 1947 | Three Month Ago July, 1947 | One Year Ago Oct., 1946 | Five Years Ago Oct., 1942 |
|---|---|---|---|---|---|---|---|
| Finished Steel | $75.41 | $75.41 | $75.41 | $75.41 | $70.80 | $64.45 | $56.73 |
| Semifinished Steel | 56.80 | 56.80 | 56.80 | 56.80 | 53.04 | 40.60 | 36.00 |
| Steelmaking Pig Iron | 36.13 | 36.13 | 36.13 | 36.14 | 33.82 | 27.50 | 23.00 |
| Steelmaking Scrap | 42.58 | 39.75 | 38.75 | 37.83 | 37.23 | 19.17 | 19.17 |

**Finished Steel Composite:**—Average of industry-wide prices on sheets, strips, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. **Semifinished Steel Composite:**—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. **Steelmaking Pig Iron Composite:**—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. **Steelworks Scrap Composite:**—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; others, gross tons.

# COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished material (except tin plate) and wire rods, cents per lb; coke, dollars per net ton; others, dollars per gross ton.

## Finished Materials

| | Oct. 25, 1947 | Sept., 1947 | July, 1947 | Oct. 1946 |
|---|---|---|---|---|
| Steel bars, Pittsburgh | 2.90c | 2.90c | 2.66c | 2.50c |
| Steel bars, del. Philadelphia | 3.318 | 3.28 | 2.98 | 2.86 |
| Steel bars, Chicago | 2.90 | 2.90 | 2.66 | 2.50 |
| Shapes, Pittsburgh | 2.80 | 2.80 | 2.56 | 2.35 |
| Shapes, del Philadelphia | 2.954 | 2.94 | 2.64 | 2.48 |
| Shapes, Chicago | 2.80 | 2.80 | 2.56 | 2.35 |
| Plates, Pittsburgh | 2.95 | 2.95 | 2.71 | 2.50 |
| Plates, del Philadelphia | 3.17 | 3.15 | 2.85 | 2.558 |
| Plates, Chicago | 2.95 | 2.95 | 2.71 | 2.50 |
| Sheets, hot-rolled, Pittsburgh | 2.80 | 2.80 | 2.56 | 2.425 |
| Sheets, cold-rolled, Pittsburgh | 3.55 | 3.55 | 3.27 | 3.275 |
| Sheets, No. 10 galv., Pittsburgh | 3.90 | 3.90 | 3.63 | †4.05 |
| Sheets, hot-rolled, Gary | 2.80 | 2.80 | 2.56 | 2.425 |
| Sheets, cold-rolled, Gary | 3.55 | 3.55 | 3.27 | 3.275 |
| Sheets, No. 10 galv., Gary | 3.90 | 3.90 | 3.63 | †4.05 |
| Strip, hot-rolled, Pittsburgh | 2.80 | 2.80 | 2.56 | 2.45 |
| Strip, cold-rolled, Pittsburgh | 3.55 | 3.55 | 3.27 | 3.05 |
| Bright basic, bess. wire, Pittsburgh | 3.675 | 3.675 | 3.475 | 3.05 |
| Wire nails, Pittsburgh | 4.25 | 4.25 | 3.975 | 3.75 |
| Tin plate, per base box, Pittsburgh | $5.75 | $5.75 | $5.75 | *$5.25 |

* Nominal. † Base, No. 24 gage.

## Semifinished Material

| | | | | |
|---|---|---|---|---|
| Sheet bars, Pittsburgh, Chicago | $60.00 | $60.00 | $53.20 | $38.00 |
| Slabs, Pittsburgh, Chicago | 47.50 | 47.50 | 43.60 | 39.00 |
| Rerolling billets, Pittsburgh | 47.50 | 47.50 | 43.60 | 39.00 |
| Wire rod 7/32 to 1/4-inch, Pitts. | 2.925c | 2.925c | 2.63c | ‡2.30c |

‡ Base, No. 5 to 7/32-in.

## Pig Iron

| | Oct. 25, 1947 | Sept., 1947 | July, 1947 | Oct. 1946 |
|---|---|---|---|---|
| Bessemer, del. Pittsburgh (N.&S. sides) | $37.913 | $37.83 | $36.03 | $29.77 |
| Basic, Valley | 36.00 | 36.00 | 34.20 | 28.00 |
| Basic, eastern del. Philadelphia | 38.84 | 38.72 | 36.47 | 29.93 |
| No. 2 fdry., del. Pgh. (N.&S. sides) | 37.41 | 37.33 | 35.53 | 29.27 |
| No. 2 fdry., del. Philadelphia | 39.34 | 39.22 | 36.97 | 30.43 |
| No. 2 foundry, Chicago | 36.00 | 36.00 | 34.20 | 28.50 |
| No. 2 foundry, Valley | 36.50 | 36.50 | 34.70 | 28.50 |
| Southern No. 2, Birmingham | 34.88 | 34.88 | 31.98 | 24.88 |
| Southern, No. 2, del. Cincinnati | 38.74 | 39.75 | 36.85 | 28.94 |
| Malleable, Valley | 36.50 | 36.50 | 34.70 | 28.50 |
| Malleable, Chicago | 36.50 | 36.50 | 34.70 | 28.50 |
| Charcoal, low phos., fob Lyles, Tenn. | 50.00 | 44.00 | 43.00 | 33.00 |
| Ferromanganese, fob cars, Pittsburgh | 151.00 | 140.25 | 140.25 | 140.00 |

## Scrap

| | | | | |
|---|---|---|---|---|
| Heavy melt. steel, No. 1, Pittsburgh | $43.00 | $38.00 | $37.20 | $20.00 |
| Heavy melt. steel, No. 2, E. Pa. | 42.00 | 36.75 | 38.06 | 18.75 |
| Heavy melt. steel, No. 1, Chicago | 42.75 | 38.75 | 35.95 | 18.75 |
| Heavy melt. steel, No. 1, Valley | 43.00 | 39.50 | 37.35 | 20.00 |
| Heavy melt. steel, No. 1, Cleveland | 41.875 | 38.25 | 37.65 | 19.50 |
| Heavy melt. steel, No. 1, Buffalo | 39.50 | 39.00 | 37.90 | 19.25 |
| Rails for rerolling, Chicago | 54.50 | 46.25 | 43.20 | 22.25 |
| No. 1 cast, Chicago | 48.50 | 43.50 | 41.10 | 25.00 |

## Coke

| | | | | |
|---|---|---|---|---|
| Connellsville, beehive furnace | $12.25 | $12.00 | $11.20 | $8.75 |
| Connellsville, beehive foundry | 14.50 | 14.50 | 13.05 | 9.50 |
| Chicago, oven foundry, del. | 18.50 | 18.50 | 17.46 | 15.10 |

# FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per gross ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants. Delivered prices do not include the 3 per cent federal tax on freight.

## Semifinished Steel

**Carbon Steel Ingots:** Rerolling quality, standard analysis, open market, $80-$85. Forging quality $46, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

**Alloy Steel Ingots:** Pittsburgh, $56.

**Rerolling Billets, Blooms, Slabs:** Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, $45-$50, sales by smaller interests on negotiated basis at $65 or higher.

**Forging Quality Billets, Blooms, Slabs:** Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, $55-$58; Detroit, del., $61; eastern Mich., $62.

**Alloy Billets, Slabs, Blooms:** Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $66, del. Detroit $69, eastern Mich., $70.

**Sheet Bars:** Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $60; sales in open market $66 to $92.

**Skelp:** Pittsburgh, Sparrows Point, Youngstown, Coatesville, 2.60c-2.65c per lb.

**Tube Rounds:** Pittsburgh, Chicago, Gary, Cleveland, $69-$70.

**Wire Rods:** Pittsburgh, Chicago, Birmingham, 7/32 to 1/4-in., inclusive $2.80-3.05 per 100 lb. 5/16 to 47/64-in., inclusive, 2.75c, Cleveland; Galveston, $2.95; Worcester, 2.90-2.95c. San Francisco (base del.), $3.52.

## Bars

**Hot-Rolled Carbon Bars (O.H. only) and Bar-Size Shapes under 3-in.:** Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham, base, 20 tons one size, 2.90c; Detroit, del., 3.05c; eastern Mich., 3.10c; New York, del., 3.31c; Phila., del., 3.318c; San Francisco (base, del), 3.63-3.95c; Los Angeles (base, del.) 3.625-3.86c; Seattle, 3.85c, base.

**Rail Steel Bars:** Same basing points as merchant carbon bars, except base is 10 tons. Prices upon application.

**Hot-Rolled Alloy Bars:** Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 3.30c; Detroit, del., 3.45c; eastern Mich., 3.50c. (Texas Steel Co. uses Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

**Cold-Finished Carbon Bars:** Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lb., 3.55c; Detroit, del., 3.70c; Toledo, 3.75c.

**Cold-Finished Alloy Bars:** Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Canton, base, 4.10c; Detroit, del., 4.25c; eastern Mich., 4.30c.

**Reinforcing Bars (New Billet):** Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.75c; San Francisco (base, del.), 3.33c; Los Angeles (base, del), 3.325c; Seattle, 3.88c, base.

**Reinforcing Bars (Rail Steel):** Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo. Prices upon application.

**Iron Bars:** Single refined, Pittsburgh 7.15c-†7.70c; double refined, 8.00-†9.75c; Pittsburgh, staybolt, 8.85c-†11.25c.

† Hand puddled.

## Sheets

**Hot-Rolled Sheets (18 gage and heavier):** Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Ashland, Ky., base, 2.80c; Granite City, 3.175c; Detroit, del., 2.95c; eastern Mich., del., 3.00c; Philadelphia, del., 3.02c; New York, del., 3.12c; Los Angeles (base, del.), 3.54c; San Francisco, (base, del.), 3.545c. (Andrews Steel Co. quotes Middletown, O., base for shipment to Detroit. Alan Wood Steel Co., Conshohocken, Pa., quotes 3.40c, Sparrows Point equivalent).

**Cold-Rolled Sheets:** Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.55c; Granite City, 3.65c; Detroit, del., 3.70c; eastern Mich., del., 3.75c; New York, del., 3.96c; Philadelphia, del., 3.968c.

**Galvanized Sheets, No. 10:** (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham, 3.85c-3.95c; Youngstown, Sparrows Point, Canton, Middletown, base, 3.95c; Granite City, 4.05c; New York, del., 4.27c; Philadelphia, del., 4.17c; Los Angeles (base, del.), 4.62c; San Francisco (base, del.), 4.625c.

**Corrugated Galvanized Sheets, No. 10:** (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham base, 3.95c-4.05c.

**Culvert Sheets, No. 16 flat:** (Based on 5 cent zinc; corrugated 10 cents extra) Pittsburgh, Chicago, Gary, Birmingham: Copper alloy, 4.45c-4.55c; copper-iron or pure iron, 4.80c-4.90c. Granite City 4.65c and 5.00c, respectively. Los Angeles (base, del.), 5.24c; San Francisco (base, del.) 5.245c.

**Aluminized Sheets:** Hot-dipped, coils or cut to lengths: Pittsburgh, 7.50c.

**Stainless-Clad 20%:** Pittsburgh, Washington, Coatesville, Pa., No. 304, 22.00c; No. 410, 20.00c; No. 430, 20.50c; No. 446, 27.00c. Prices include annealing and pickling.

**Long Ternes, No. 10:** Pittsburgh, Chicago, Gary, base, 3.85c-4.05c.

**Enameling Sheets, No. 12:** Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 3.90c-3.95c; Granite City, 4.05c; Detroit, del., 4.10c; eastern Mich., 4.15c.

**Electrical Sheets, No. 24:** Field: Pittsburgh, Chicago, Gary, 4.50c; Kokomo, Ind., 4.60c. Armature: Pittsburgh, Chicago, Gary, 4.80c; Granite City, Ill., Kokomo, Ind., 4.90c. Electrical: Pittsburgh, Chicago, Gary, 5.30c; Granite City, Kokomo, 5.40c. Motor: Pittsburgh, Chicago, Gary, 6.05c; Granite City, 6.15c. Dynamo: Pittsburgh, 6.75c; Granite City, 6.85c. Transformer 72, 7.25c; 65, 7.95c; 58, 8.65c; 52, 9.45c, Pittsburgh.

## Strip

**Hot-Rolled Strip:** Pittsburgh, Chicago, Gary, Birmingham, Youngstown, base, 2.80c; Detroit, del., 2.95c; eastern Mich., del., 3.00c; San Francisco (base, del.), 3.605c; Los Angeles (base, del.), 3.60c.

**Cold-Rolled Strip:** 0.25 carbon and less: Pittsburgh, Cleveland, Youngstown, 3.55c; Chicago, base, 3.65c; Detroit, del. 3.70c; eastern Mich., 3.75c; Worcester, base, 3.75c-4.10c.

**Cold-Finished Spring Steel:** Pittsburgh, Cleveland base: 0.26-0.40 carbon, 3.55c; over 0.40 to 0.60 carbon, 5.05c, over 0.60 to 0.80, 5.65c; over 0.80 to 1.05, 7.15c; over 1.05 to 1.35, 9.45c; add 0.20c for Worcester.

## Tin, Terne, Plate

**Tin Plate:** Pittsburgh, Chicago, Gary, Warren, O., 100-lb base box, $5.75; Granite City, Birmingham, Sparrows Point, $5.85.

**Electrolytic Tin Plate:** Pittsburgh, Gary, Warren, O., 100-lb base box 0.25 lb tin, $4.85; 0.50 lb tin, $5.05; 0.75 lb tin, $5.25; Granite City, Birmingham, Sparrows Point, $4.95, $5.15, $5.35, respectively.

**Tin Mill Black Plate:** Pittsburgh, Chicago, Gary, Warren, O., base 29-gage and lighter, 3.90c; Granite City, Birmingham, Sparrows Point, 4.00c.

**Manufacturing Ternes (Special Coated):** Pittsburgh, Chicago, Gary, 100-lb base box $4.90; Granite City, Birmingham, Sparrows Point, $5.00.

**Roofing Ternes:** Pittsburgh, per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $14.10.

## Plates

**Carbon Steel Plates:** Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, 2.95c; Coatesville, Claymont, 3.15c; Geneva, Utah, (base, del.), 3.125c; New York, del. 3.27c; Phila., del., 3.17c; St. Louis, del., 2.77c; Boston, del. 3.423c; San Francisco and Los Angeles, del., 3.59c for sizes and grades produced at Geneva, 3.76c for sizes and grades produced at Fontana, Calif.

(Central Iron & Steel Co., Harrisburg, Pa., 4.45c, basing points.)

**Floor Plates:** Pittsburgh, Chicago, 4.20c.

**Open-Hearth Alloy Plates:** Pittsburgh, Chicago, 3.80c-4.137c; Coatesville, 4.50c.

**Clad Steel Plates:** Coatesville, 10% cladding: Nickel clad, 21.50c; inconel-clad, 30.00c; monel-clad, 29.00c.

Pittsburgh, Washington, Coatesville, Pa., 20% stainless-clad, base prices including annealing and pickling: No. 304, 24.00c; No. 410, 22.00c; No. 430, 22.50c; No. 446, 29.00c.

## Shapes

**Structural Shapes:** Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.80c; New York, del., 3.02c; Phila., del., 2.954c; Geneva, Utah (base, del.), 2.975c; Los Angeles (base, del.), 3.41c-3.47c for sizes produced at Torrance, Calif., beyond sizes at Geneva; Los Angeles and San Francisco, del., 3.44c for sizes produced at Geneva; San Francisco, del., 3.41c for sizes produced at Fontana, Calif.

**Alloy Structural Shapes:** Pittsburgh, Chicago, 3.55c.

**Steel Piling:** Pittsburgh, Chicago, Buffalo, $3.30 per 100 lb.

## Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds).

**Wire to Manufacturers in carloads**

| | |
|---|---|
| Bright, basic or bessemer | •$3.55-3.80 |
| Spring (except Birmingham) | ••$4.25-••4.50 |

**Wire Products to Trade**

| | |
|---|---|
| **Nails** | |
| Standard and cement-coated | †$4.25 |
| Galvanized | ‡$4.00 |
| Staples, polished and galvanized | $4.25 |
| **Wire, Merchant Quality** | |
| Annealed (6 to 8 base) | ‡$4.20 |
| Galvanized (6 to 8 base) | ‡$4.65 |
| (Fob Pittsburgh, Chicago, Birmingham, per base column) | |
| **Woven fence,** 15 gage and heavier | ††91 |
| **Barbed wire,** 80-rod spool | ††101 |
| **Barbless wire,** twisted | 101 |
| **Fence posts** (no clamps) | ††90 |
| **Bale ties, single loop** | ††91 |

• **Worcester, $3.65, Duluth, $3.60, base. San Francisco (base, del) $4.56, bright basic only.**

•• **Worcester $4.60, Duluth and Trenton, N. J., $4.75, base. San Francisco (base, del.) $5.63 for MB spring wire; $5.28 black premier.**

† **Worcester $4.55, Cleveland $4.35, base. San Francisco (base, del.) $5.33.**

‡ **Duluth $4.00, Cleveland $4.10, base. San Francisco (base, del.) $5.08.**

§ **Worcester $4.30, annealed; $4.75, galvanized. Duluth $4.20, annealed; $4.65, galvanized. San Francisco (base, del.) $5.21, annealed; $5.66, galvanized.**

†† **San Francisco (base, del.): Woven fence, 114; barbed wire, 121; bale ties, 115. Duluth (base): Woven fence, 91; barbed wire, 101; fence posts 90.**

## Rails, Supplies

**Rails:** Standard, over 60-lb fob mill, $2.75 per 100 lb. Light rails (billet), Pittsburgh, Birmingham, $3.10 per 100 lb; light rails (rail steel), Williamsport, Pa., Pittsburgh prices upon application.

Relaying, 60 lb and over fob warehouse $55-$56 per net ton.

**Supplies:** Track bolts, 7.00c; heat treated, 7.25c. Tie plates, $3.05 per 100 lb, fob mill; $3.40 base, Seattle; $3.20, base, Pittsburg, Calif. Splice bars, $3.25 per 100 lb, fob mill. Standard spikes, 4.85c; screw spikes, 6.75c. Axles, 4.10c.

## Tubular Goods

**Standard Steel Pipe:** Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh on all types; Lorain on steel butt weld, and seamless; Gary, Ind., 2 points less on steel lap weld and 1 point less on steel butt weld on sizes produced in that district.

| | Butt Weld | | | | |
|---|---|---|---|---|---|
| In. | Blk. | Gal. | In. | Blk. | Gal. |
| ⅛ | 46 | 19½ | 1 | 56 | 41½ |
| ¼ | 47 | 25 | 1¼ | 56½ | 42 |
| ⅜ | 44 | 22 | 1½ | 57 | 42½ |
| ½ | 50½ | 34½ | 2 | 57½ | 43 |
| ¾ | 53½ | 38½ | 2½ & 3 | 58 | 43½ |

| | Lap Weld | | Elec. Weld | | Seamless | |
|---|---|---|---|---|---|---|
| In. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. |
| 2 | 49 | 34 | 48½ | 33½ | 48 | 33 |
| 2½-3 | 52 | 37 | 51½ | 36½ | 51 | 36 |
| 3½-6 | 54 | 39 | 53½ | 38½ | 53 | 38 |

**Line Steel Pipe:** Base price in carlots to consumers about $200 a net ton. Base discounts Pittsburgh and Lorain, O.

| In. | Butt Weld | In. | Butt Weld |
|---|---|---|---|
| ⅛ | 45 | 1 | 55 |
| ¼ | 46 | 1¼ | 55½ |
| ⅜ | 43 | 1½ | 56 |
| ½ | 49½ | 2 | 56½ |
| ¾ | 52½ | 2½ & 3 | 57 |

| In. | Lap Weld | Elec. Weld | Seamless |
|---|---|---|---|
| 2 | 48 | 47½ | 47 |
| 2½ & 3 | 51 | 50½ | 50 |
| 3½-6 | 53 | 52½ | 52 |
| 8 | 53½ | 53 | 52½ |
| 10 | 53 | 52½ | 52 |
| 12 | 52 | 51½ | 51 |

**Boiler Tubes:** Net base prices per 100 ft, fob Pittsburgh, in carload lots, minimum wall thickness, cut lengths 4 to 24 feet, inclusive.

| | | —Seamless— | | —Elec. Weld— | |
|---|---|---|---|---|---|
| O.D. Sizes | B.W.G. | Hot Rolled | Cold Drawn | Hot Rolled | Cold Drawn |
| 1" | 13 | .... | $11.87 | $11.51 | $11.51 |
| 1¼" | 13 | .... | 14.06 | 11.48 | 13.64 |
| 1½" | 13 | $13.08 | 15.69 | 12.69 | 15.22 |
| 1¾" | 13 | 14.88 | 17.85 | 14.43 | 17.31 |
| 2" | 13 | 16.67 | 19.99 | 16.17 | 19.39 |
| 2¼" | 13 | 18.58 | 22.29 | 18.02 | 21.62 |
| 2¼" | 12 | 20.47 | 24.54 | 19.86 | 23.80 |
| 2½" | 12 | 22.42 | 26.87 | 21.75 | 26.06 |
| 2¾" | 12 | 23.76 | 28.48 | 23.05 | 27.63 |
| 3" | 12 | 24.93 | 29.90 | 24.18 | 29.00 |
| 3¼" | 11 | 29.03 | 34.81 | 28.16 | 33.77 |
| 3½" | 11 | 31.17 | 37.39 | 30.23 | 36.27 |
| 4" | 10 | 38.69 | 46.38 | 37.53 | 44.99 |
| 4½" | 9 | 51.28 | 61.50 | .... | .... |
| 5" | 9 | 59.39 | 71.18 | .... | .... |
| 6" | 7 | 91.13 | 109.27 | .... | .... |

**Pipe, Cast Iron:** Class B, 6-in. and over $74.50 per net ton, Birmingham; $79.50, Burlington, N. J.; $86.12, del. Chicago; 4-in. pipe, $5 higher; class A pipe, $5 a ton over Class B.

## Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 15c per cwt, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire, step and plow bolts.

**Carriage and Machine Bolts**

| | |
|---|---|
| ½-in. and smaller; up to 6 in. in length | 45 off |
| ⅝ and ⅝ x 6-in. and shorter | 46 off |
| ¾-in. and larger x 6-in. and shorter | 43 off |
| All diameters longer than 6-in. | 41 off |
| Tire bolts | 35 off |
| Step bolts | 43 off |
| Plow bolts | 54 off |
| Lag bolts | |
| All diameters 6 in. and shorter | 46 off |
| All diameters longer than 6 in. | 44 off |

**Stove Bolts**

In packages, nuts separate, 65-10 off; bulk 7⅛ off on 15,000 of 3-in. and shorter, or 5000 over 3-in., nuts separate.

**Nuts**

| Semifinished hexagon | A.S.E. Light | A.S.E. Reg. and Heavy |
|---|---|---|
| ⅞-in. and smaller | 46 off | .... |
| ⅛-in. and smaller | .... | 44 off |
| ⅛-in.-1-in. | 44 off | .... |
| ⅛-in.-1-in. | .... | 43 off |
| 1⅛-in.-1½-in. | 42 off | 41 off |
| 1⅝-in. and larger | .... | 35 off |

Additional discount of 15 for full containers.

**Hexagon Cap Screws**
(Packaged)

| | |
|---|---|
| Upset 1-in. smaller by 6-in. and shorter (1020 bright) | 53 off |
| Upset (1035 heat treated) | |
| ⅝ and smaller x 6 and shorter | 48 off |
| ¾, ⅞, & 1 x 6 and shorter | 44 off |

**Square Head Set Screws**

| | |
|---|---|
| Upset 1-in. and smaller | 57 off |
| Headless, ¼-in. and larger | 40 off |
| No. 10 and smaller | 52 off |

## Rivets

Fob Pittsburgh, Cleveland, Chicago Birmingham

| | |
|---|---|
| Structural ½-in. and larger | 5.65c |
| Lebanon, Pa. | 5.80c |
| ⅞-in. and under | .55 off |
| Lebanon, Pa. | .55 off plus 15c per cwt |

## Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, lcl $1-$2 off

## Tool Steels

**Tool Steel:** Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 16.00-17.00c; extra carbon 20.00c; special carbon 24.00c; oil-hardening 26.00c; high carbon-chromium 47.00c.

| W | Cr | V | Mo | Base, Per lb |
|---|---|---|---|---|
| 18.00 | 4 | 1 | ... | 82.00c |
| 1.5 | 4 | 1 | 8.5 | 59.00c |
| 12 | 3 | 0.50 | ... | 67.00c |
| 6.40 | 4.15 | 1.90 | 5 | 63.00c |
| 5.50 | 4.50 | 4 | 4.50 | 80.00c |

## Stainless Steels

Base, Cents per lb

| Grade | Bars, Drawn Wire, Structurals | Plate | Sheets | Hot Rolled Strip | Cold Rolled Strip |
|---|---|---|---|---|---|
| **CHROMIUM NICKEL STEELS** | | | | | |
| 301 | 26.00c | 29.50c | 37.00c | 22.00c | 28.00c |
| 302 | 26.00 | 29.50 | 37.00 | 23.50 | 30.50 |
| 303 | 28.50 | 31.50 | 39.00 | 29.50 | 36.00 |
| 304 | 27.50 | 31.50 | 39.00 | 25.50 | 32.50 |
| 308 | 31.50 | 37.00 | 44.50 | 31.00 | 38.00 |
| 309 | 39.00 | 43.50 | 51.00 | 40.50 | 51.00 |
| 310 | 53.50 | 56.50 | 57.50 | 53.00 | 61.00 |
| 316 | 43.50 | 48.00 | 52.00 | 43.50 | 52.00 |
| 321 | 31.50 | 37.00 | 44.50 | 32.00 | 41.50 |
| 347 | 36.00 | 41.50 | 49.00 | 36.00 | 45.50 |
| 431 | 21.00 | 24.00 | 31.50 | 19.00 | 24.50 |
| 440A | 26.00 | 31.00 | 36.50 | 26.00 | 30.50 |
| **STRAIGHT CHROMIUM STEEL** | | | | | |
| 403 | 23.50 | 27.00 | 32.00 | 23.00 | 29.50 |
| 410 | 20.50 | 23.50 | 29.00 | 18.50 | 24.00 |
| 416 | 21.00 | 24.00 | 29.50 | 20.00 | 25.50 |
| 420 | 26.00 | 31.00 | 36.50 | 26.00 | 39.50 |
| 430 | 21.00 | 24.00 | 31.50 | 19.00 | 24.50 |
| 430F | 21.50 | 24.50 | 32.00 | 20.50 | 27.00 |
| 442 | 24.50 | 28.00 | 35.50 | 26.00 | 35.00 |
| 443 | 24.50 | 28.00 | 35.50 | 26.00 | 35.00 |
| 446 | 30.00 | 33.00 | 39.50 | 38.00 | 56.50 |
| •501 | 9.00 | 13.00 | 17.50 | 13.00 | 18.50 |
| •502 | 10.00 | 14.50 | 18.50 | 14.50 | 19.50 |
| **†STAINLESS CLAD STEEL (20%)** | | | | | |
| 304 | .... | 24.00 | 22.00 | .... | .... |
| 410 | .... | 22.00 | 20.00 | .... | .... |
| 430 | .... | 22.50 | 20.50 | .... | .... |
| 446 | .... | 29.00 | 27.00 | .... | .... |

• Low chromium. † Fob Pittsburgh and Washington, Pa.; plate prices include annealing and pickling.

# RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

## Pig Iron

| Per Gross Ton | Basic | No. 2 Foundry | Malleable | Bessemer |
|---|---|---|---|---|
| **Bethlehem, Pa., base** | $37.00 | $37.50 | $38.00 | $38.50 |
| Newark, N. J., del. | 39.02 | 39.52 | 40.02 | 40.52 |
| Brooklyn, N. Y., del. | .... | 40.50 | 44.30 | .... |
| Philadelphia, del. | 38.84 | 39.34 | 39.84 | 40.34 |
| **Birdsboro, Pa.,** base | 40.00 | 40.50 | 41.00 | 41.50 |
| **Birmingham,** base | 32.88* | 33.38* | .... | .... |
| Baltimore, del. | .... | 40.42 | .... | .... |
| Chicago, del. | .... | 36.62 | .... | .... |
| Cincinnati, del. | .... | 38.74 | .... | .... |
| Newark, N. J., del. | .... | 39.14 | .... | .... |
| Philadelphia, del. | .... | 38.96 | .... | .... |
| St. Louis, del. | .... | 37.77 | .... | .... |
| **Buffalo,** base | 36.00* | 36.00* | 36.50* | 37.00 |
| Boston, del. | 43.13 | 43.13 | 43.63 | 44.13 |
| Rochester, del. | 38.02 | 38.02 | 38.52 | 39.02 |
| Syracuse, del. | 38.75 | 38.75 | 39.25 | 39.75 |
| **Canton, Massillon, O.,** base | 35.50 | 36.00 | 36.50 | .... |
| **Chicago,** base | 35.50 | 36.00 | 36.50 | 37.00 |
| Milwaukee, del. | 36.95 | 37.45 | 37.95 | 38.45 |
| Muskegon, Mich., del. | .... | 40.21 | 40.71 | .... |
| **Cleveland,** fob furnace | 35.50* | 36.00* | 36.50* | 37.00 |
| Akron, del. | 37.34 | 37.84 | 38.34 | 38.84 |
| **Duluth,** base | 36.00 | 36.50 | 37.00 | 37.50 |
| **Erie, Pa.,** base | 35.50 | 36.00 | 36.50 | 37.00 |
| **Everett, Mass.,** base | .... | 45.00 | 45.50 | .... |
| **Granite City, Ill.,** base | 36.50 | 37.00 | .... | .... |
| St. Louis, del. | 37.33 | 37.83 | .... | .... |
| †**Neville Island, Pa.,** base | 36.00 | 36.50 | 36.50 | 37.00 |
| Pittsburgh, del., N.&S. Sides | 36.913 | 37.413 | 37.413 | 37.913 |
| **Provo, Utah,** base | 36.00 | 36.50 | .... | .... |
| Seattle, Tacoma, Wash., del. | .... | 43.03 | .... | .... |
| Portland, Oreg., del. | .... | 43.03 | .... | .... |
| **Sharpsville, Pa.,** base | 36.00 | 36.50 | 36.50 | 37.00 |
| **Steelton, Pa.,** base | 37.00 | 37.50 | 38.00 | 38.50 |
| **Struthers, O.,** base | 36.50 | 37.00 | 37.00 | 37.50 |
| **Swedeland, Pa.,** base | 41.00 | 41.50 | 42.00 | 42.50 |
| **Troy, N. Y.,** fob furnace | 39.50 | .... | 40.00 | .... |
| **Toledo, O.,** base | 35.50 | 36.00 | 36.50 | 37.00 |
| Cincinnati, del. | 39.35 | 39.85 | .... | .... |
| **Youngstown, O.,** base | 36.00 | 36.50 | 36.50 | 37.00 |
| Mansfield, O., del. | 39.28 | 39.78 | 39.78 | 40.28 |

† To Neville Island base add: 72.6c for McKees Rocks, Pa., $1.111 Lawrenceville, Homestead, McKeesport, Ambridge, Monaco, Aliquippa; $1.463 Oakmont, Verona; $1.639 Brackenridge.

* Republic Steel Corp., quotes $3 a ton higher at Birmingham, effective Aug. 13; $2.00 higher at Buffalo for No. 2 foundry and malleable and $1.50 higher for basic and $2.75 higher at Cleveland, effective on shipments during week ended Oct. 26.

### Blast Furnace Silvery Pig Iron

6.00-6.50 per cent (base) ...$45.50

| | | | |
|---|---|---|---|
| 6.51-7.00.. | $46.75 | 9.01- 9.50. | 53.00 |
| 7.01-7.50.. | 48.00 | 9.51-10.00. | 54.25 |
| 7.51-8.00.. | 49.25 | 10.01-10.50. | 55.50 |
| 8.01-8.50.. | 50.50 | 10.51-11.00. | 56.75 |
| 8.51-9.00.. | 51.75 | 11.01-11.50. | 58.00 |

Fob Jackson, O., per gross ton; Buffalo base $1.25 higher. Buyer may use whichever base is more favorable.

### Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

**Electric Furnace Silvery Pig Iron:** Si 14.01-14.50%, $70.75, Jackson, O.; $73.75, Niagara Falls; $73, open-hearth and foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.5% Mn over 1%; $1 a ton for 0.045% max. phos.

### Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn....$50.00 (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

### Gray Forge

Neville Island, Pa. .....$36.00

### Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., $42.00; Birdsboro, Pa., $45 base; Philadelphia, $44.38, del. Intermediate phosphorus, Central furnace, Cleveland, $39.00.

### Differentials

Basing point prices are subject to following differentials:

**Silicon:** An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

**Phosphorus:** A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

**Manganese:** An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

**Nickel:** An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

## Metallurgical Coke

Price per Net Ton

### Beehive Ovens

| | |
|---|---|
| Connellsville, furnace.. | $12.00-$12.50 |
| Connellsville, foundry.. | 14.00- 15.00 |
| New River, foundry... | 12.50 |
| Wise county, foundry. | 11.15 |
| Wise county, furnace.. | 10.65 |

### Oven Foundry Coke

| | |
|---|---|
| Kearney, N. J., ovens. | $17.85 |
| Chicago, outside del... | 17.50 |
| Chicago, del. | 18.50 |
| Terre Haute, del. | 18.15 |
| Milwaukee, ovens | 18.25 |
| New England, del. | 19.60 |
| Birmingham, del. | 15.10 |
| Indianapolis, ovens | 17.00 |
| Cincinnati, del. | 16.60 |
| Ironton, O., ovens | 15.50 |
| Painesville, ovens | 16.60 |
| Cleveland, del. | 18.00 |
| Buffalo, del. | 18.35 |
| Detroit, del. | 17.75 |
| Philadelphia, ovens | 16.90 |
| Swedeland, Pa., ovens. | 16.90 |
| Portsmouth, O., ovens. | 16.00 |
| Fairmont, W. Va., ovens | 15.75 |
| Pittsburgh, del. | 17.71 |

## Coal Chemicals

Spot, gal. freight allowed east of Omaha. Effective as of Apr. 1, 1947.

| | |
|---|---|
| Pure and 90% benzol | 19.00c |
| Toluol, two degrees | 23.00c |
| Industrial xylol | 23.00c |
| Solvent naphtha | 26.00c |

Per pound fob works

| | |
|---|---|
| Phenol (car lots, returnable drums) | 11.25c |
| Do., less than carlots. | 12.00c |
| Do., tank cars | 10.25c |

Eastern plants, per pound

| | |
|---|---|
| Naphthalene flakes, balls, bbl, to jobbers, "house-hold use" | 9.50c |

Per ton, bulk, fob plants

| | |
|---|---|
| Sulphate of ammonia | $30.00 |

## Refractories

Per 1000, fob shipping point

Net Prices

### Fire Clay Brick

Super Duty

| | |
|---|---|
| Pa., Mo., Ky. | $87.00 |

High Heat Duty

| | |
|---|---|
| Pa., Ill., Md., Mo., Ky. | 70.00 |
| Ala., Ga. | 70.00 |
| N. J. | 75.00 |

Intermediate Heat Duty

| | |
|---|---|
| Ohio | 64.00 |
| Pa., Ill., Md., Mo., Ky. | 64.00 |
| Ala., Ga. | 56.00 |
| N. J. | 67.00 |

Low-Heat Duty

| | |
|---|---|
| Pa., Md., Ohio | 56.00 |

### Ladle Brick

(Pa., O., Va., Mo.)

| | |
|---|---|
| Dry Press | 47.00 |
| Wire Cut | 45.00 |

### Malleable Bung Brick

| | |
|---|---|
| All bases | 80.00 |

### Silica Brick

| | |
|---|---|
| Pennsylvania | 70.00 |
| Joliet, E. Chicago | 79.00 |
| Birmingham, Ala. | 70.00 |

### Basic Brick

Net tons, fob Baltimore, Plymouth Meeting, Chester, Pa.

| | |
|---|---|
| Chrome brick | 59.00 |
| Chem. bonded chrome | 59.00 |
| Magnesite brick | 81.00 |
| Chem. bonded magnesite.. | 70.00 |

### Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.

| | |
|---|---|
| Bulk | 24.00 |
| Single bags | 28.00 |

### Dolomite

Domestic, dead-burned, bulk, net ton, fob Billmeyer, Blue Bell or Williams, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibsonburg or Woodville, O., $11.05; Midwest (fob Thornton or McCook, Ill.), add $0.10; Missouri Valley (fob Dolly Siding, and Bonne Terre, Mo.), add $0.20.

## ORES

### Lake Superior Iron Ore

*Gross ton, 51½% (Natural) Lower Lake Ports*

| | |
|---|---|
| Old range bessemer | $5.95 |
| Old range nonbessemer | 5.80 |
| Mesabi bessemer | 5.70 |
| Mesabi nonbessemer | 5.50 |
| High phosphorus | 5.55 |

### Eastern Local Ore

*Cents, units, del. E. Pa.*

| | |
|---|---|
| Foundry and basic 56.63% contract | 15.25 |

### Foreign Ore

*Cents per unit, cif Atlantic ports*

| | |
|---|---|
| No. African low phos. | Nom. |
| Swedish basic, 60 to 68% | 13.50 |
| Spanish, No. African basic, 50 to 60% | Nom. |
| Brazil iron ore, 68-69% fob Rio de Janeiro, nom. | 5.50-6.50 |

### Tungsten Ore

| | |
|---|---|
| Wolframite and scheelite per short ton unit, duty paid | $32-$34 |

### Manganese Ore

46.50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 63.00c-67.00c.

### Chrome Ore

*Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Oreg., or Tacoma, Wash.*

*(S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)*

| | |
|---|---|
| Indian and African | |
| 48% 2.8:1 | $37.50 |
| 48% 3:1 | 39.00 |
| 48% no ratio | 31.00 |
| South African (Transvaal) | |
| 44% no ratio | $27-$27.50 |
| 45% no ratio | 28.00 |
| 48% no ratio | 30.00 |
| 50% no ratio | 31.00 |
| Brazilian—nominal | |
| 44% to 2.5:1 lump | $33.65 |
| 48% 3:1 lump | 43.50 |
| Rhodesian | |
| 45% no ratio | $27-$27.50 |
| 48% no ratio | 30.00 |
| 48% 3:1 lump | 39.00 |
| Domestic (seller's nearest rail) | |
| 48% 3:1 | $39.00 |

### Molybdenum

| | |
|---|---|
| Sulphide conc., lb., Mo. cont., Mines | $0.75 |

## Fluorspar

Metallurgical grade, fob shipping point, in Ill., Ky., net tons, carloads, effective $CaF_2$ content, 70% or more, $33; 65% to 70%, $32; 60% to 65%, $31; less than 60%, $30.

## HIGH-STRENGTH—LOW-ALLOY STEELS

Prices in dollars per 100 pounds

| | Pittsburgh | Chicago | Gary | Youngstown | Sparrows Point | Buffalo | Bethlehem | Canton | Massillon |
|---|---|---|---|---|---|---|---|---|---|
| Sheets, Hot-Rolled | 4.30 | 4.30 | 4.30 | 4.30 | 4.30 | 4.30 | ... | ... | ... |
| Cold-Rolled | 5.30 | 5.30 | 5.30 | 5.30 | ... | 5.30 | ... | ... | ... |
| Galvanized | 5.85 | ... | ... | ... | ... | ... | ... | ... | ... |
| Strip, Hot-Rolled | 4.30 | 4.30 | 4.30 | 4.30 | ... | ... | ... | ... | ... |
| Cold-Rolled | 5.30 | 5.30* | 5.30* | 5.30 | ... | ... | ... | ... | ... |
| Shapes, Structural | 4.30 | 4.30 | ... | 4.30 | ... | ... | 4.30 | ... | ... |
| Plates | 4.55 | 4.55 | 4.55 | ... | 4.55 | ... | ... | ... | ... |
| Bars, Small Shapes | 4.45 | 4.45 | 4.45 | 4.45 | ... | 4.45 | ... | 4.45 | 4.45 |

* Nax High Tensile, produced by Great Lakes Steel Corp., quoted 10 cents higher

# WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

| | SHEETS | | | | | STRIP | | BARS | | | | PLATES | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H-R 10G | C-R 10G | C-R 17G | Gal. *10G | Gal. *24G | †H-R | †C-R | H-R Rds. ⅝" to 3" | C-F Rds. ½"& up | H-R Alloy (8140) | Structural Shapes | Carbon ⅜"-¾" | Floor ¾" & Thicker |
| Boston (city) | 4.96 | 6.03[4] | 5.73[4] | 6.16[4] | 7.41[4] | 5.04 | 6.73 | 4.95 | 5.63 | 7.22 | 4.82 | 5.11 | 6.79 |
| ††New York (city) | 4.91 | 6.12 | 5.82[8] | 6.11 | 7.36 | 5.03 | .... | 5.02 | 5.57 | 7.00[9] | 4.75 | 5.06 | 6.76 |
| New York (country) | 4.76 | 5.97 | 5.67[8] | 5.96 | 7.21 | 4.88 | .... | 4.87 | .... | .... | 4.60 | 4.91 | 6.61 |
| Philadelphia (city) | 4.67 | 6.28 | 5.88 | 5.87 | 7.12 | 4.78 | 5.68 | 4.83 | 5.53 | 6.95[9] | 4.55 | 4.82 | 6.31 |
| Philadelphia (country) | 4.57 | 6.18 | 5.78 | .... | .... | 4.68 | 5.58 | 4.73 | .... | 6.85[9] | 4.45 | 4.72 | 6.21 |
| Baltimore (city) | 4.29† | 5.85 | 5.55 | 5.54 | 6.79 | 4.70 | .... | 4.75 | 5.45 | .... | 4.64 | 4.74 | 6.20 |
| Baltimore (country) | 4.19† | 5.75 | 5.45 | 5.35 | 6.60 | 4.60 | .... | 4.65 | .... | .... | 4.54 | 4.64 | 6.10 |
| Washington (city) | 4.75 | .... | .... | .... | .... | 4.95 | .... | 5.00 | 5.60[12] | .... | 4.90 | 4.95 | 6.60 |
| Washington (country) | 4.65 | .... | .... | .... | .... | 4.85 | .... | 4.90 | .... | .... | 4.80 | 4.85 | 6.50 |
| Norfolk, Va. | 4.80 | .... | .... | .... | .... | .... | .... | 5.10 | 5.90 | .... | 5.05 | 5.05 | 6.80 |
| Memphis, Tenn. (city) | 4.82[20]§§ | 5.87[20]† | .... | 6.37 | .... | 5.02[20] | .... | 4.97[20] | 5.87 | .... | 4.97[20] | 5.17[20] | 6.87[20] |
| Memphis, Tenn. (country) | 4.72[20]§§ | 5.77[20]† | .... | 6.27 | .... | 4.92[20] | .... | 4.87[20] | 5.77 | .... | 4.87[20] | 5.07[20] | 6.77[20] |
| Buffalo (city) | 4.45 | .... | 5.20[5] | 6.00 | .... | 4.70 | 5.65 | 4.40 | 5.10 | 8.15 | 4.40 | 4.95 | 6.20 |
| Buffalo (country) | 4.30 | .... | 5.05[5] | 5.55 | .... | 4.25 | 5.50 | 4.25 | 4.95 | 8.15 | 4.25 | 4.45 | 5.75 |
| Pittsburgh (city) | 4.25§§ | .... | 5.10[8]† | 5.65 | 6.90 | 4.35 | 5.35 | 4.40 | 5.10 | 6.65 | 4.40 | 4.60 | 5.90 |
| Pittsburgh (country) | 4.15§§ | .... | 4.90[8]† | 5.50 | 6.75 | 4.20 | 5.20 | 4.25 | 4.95 | 6.65 | 4.25 | 4.45 | 5.75 |
| Cleveland (city) | 4.45 | 5.50[5] | 5.20[5] | 5.79 | 7.04 | 4.52 | 5.35 | 4.40 | 5.10 | 6.93 | 4.65 | 4.60 | 6.15 |
| Cleveland (country) | 4.30 | 5.35[5] | 5.05[5] | .... | .... | .... | 5.20 | 4.25 | 4.95. | .... | .... | 4.40 | .... |
| Cincinnati (city) | 4.671 | 5.516[5] | .... | 5.716 | 6.466 | 4.694 | .... | 4.703 | 5.353 | .... | 4.744 | 4.903 | 6.244 |
| Detroit | 4.55 | .... | 5.30 | .... | .... | 4.72 | 5.63 | 4.50 | 5.22 | 7.10 | 4.77 | 4.88 | 6.28 |
| Indianapolis | 4.55 | 5.32[5] | .... | 5.87 | 7.12 | 4.65 | 5.90 | 4.70‡‡ | 5.40 | 8.85 | 4.70 | 4.90 | 6.35 |
| Chicago (city) | 4.45 | 5.50[5] | 5.20[5] | 5.65 | 6.90 | 4.35 | 5.45 | 4.40 | 5.10 | 6.65[9] | 4.40 | 4.60 | 6.05 |
| Chicago (country) | 4.30 | 5.35[5] | 5.05[5] | 5.50 | 6.75 | 4.20 | 5.30 | 4.25 | 4.95 | 6.65[9] | 4.25 | 4.45 | 5.90 |
| Milwaukee | 4.629 | 5.679[5] | 5.379[5] | 5.829 | 7.079 | 4.529 | 5.629 | 4.579 | 5.279 | 6.979[9] | 4.579 | 4.779 | 6.229 |
| St. Louis | 4.749 | 5.799[9] | 5.499[5] | 5.974 | 7.224 | 4.649 | 5.774 | 4.699 | 5.424[12] | 7.124 | 4.699 | 4.899 | 6.349 |
| Birmingham (city) | 4.45[20]§§ | .... | .... | 5.65 | .... | 4.45[20] | .... | 4.40[20] | 5.93[22] | .... | 4.40 | 4.65 | 6.86 |
| Birmingham (country) | 4.30[20]§§ | .... | .... | 5.50 | .... | 4.30[20] | .... | 4.25[20] | .... | .... | 4.25 | 4.50 | .... |
| New Orleans | 4.98[20]** | .... | 6.29[18] | .... | .... | 5.18[20] | .... | 5.13[20]** | 6.29[11] | .... | 5.03[20]** | 5.33[20] | 7.29[20] |
| Omaha, Nebr. | 5.365 | .... | .... | 6.565 | 7.815 | 5.265 | .... | 5.315 | 6.015 | .... | 5.315 | 5.515 | 6.965 |
| Seattle, Tacoma, Wash. | 5.30[17]§§ | .... | 7.10[8]‡ | 6.70 | .... | 5.60[17] | .... | 5.45[17] | 7.45[19] | 8.50[12] | 5.25[17] | 5.45[17] | 7.55[17] |
| Portland, Oreg. | 5.30[17]§§ | .... | 7.10[8]‡ | 6.70 | .... | 5.60[17] | .... | 5.45[17] | 7.45[19] | .... | 5.25[17] | 5.45[17] | 7.55[17] |

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over, cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—any quantity; [2]—300 to 1999 lb; [3]—150 to 2249 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [6]—one bundle to 1499 lb; [7]—one to nine bundles; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [10]—450 to 39,999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [13]—400 to 14,999 lb; [14]—400 to 39,999; [15]—2000 lb and over; [16]—1000 to 4999 lb; [17]—300 to 9999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [22]—500 to 1499 lb.

* Include gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § as rolled; ** add 0.40 for sizes not rolled in Birmingham; †† same prices quoted for Jersey City, N. J.; ‡‡ add 15c for 100 lb for slow moving items; §§ 18 gage and heavier.

# PRICES OF LEADING FERROALLOYS PRODUCTS

### MANGANESE ALLOYS

**Spiegeleisen: (19-21% Mn, 1-3% Si.)** Carlot per gross ton, $47, Palmerton, Pa., $51, Pittsburgh. 16% to 19% Mn., $46, Palmerton, $50, Pittsburgh.

**Standard Ferromanganese:** (Mn 78-82%, C 7% approx.). Carload, lump, bulk $145 per gross ton of alloy, carload packed $153, ton lot $165, less ton $172; fob New Orleans, Mobile, Philadelphia, Baltimore, or New York. Carload, lump, bulk $151, fob cars Pittsburgh, including 50c switching charge. Add, or subtract, $1.80 for each 1%, or fraction thereof, of contained manganese over 82% or under 78%.

**West Coast Prices:** Carload (80,000 lb or more), lump, bulk, same price and basing points as above. All other prices for shipment from Pacific Coast warehouses, add $26.21 to above prices. Delivery is fob Portland, Los Angeles, South San Francisco, or Seattle warehouses, with railroad freight allowed on shipments of 25 gross tons or more.

**Low-Carbon Ferromanganese, Regular Grade:** (Mn 80-85%). Eastern Zone, carload, lump, bulk, max. 0.10% C, 22.5c per lb of contained Mn, carload packed 23c, ton lot 23.6c, less ton 24.2c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Deduct 0.5c for max 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add, 0.5c to above prices. Spot, add 0.25c.

**Medium-Carbon Ferromanganese:** (Mn 80-85%, C 1.5% max., Si 1.5% max.). Eastern Zone, carload, lump, bulk 16.5c per lb of contained Mn, carload packed 17c, ton lot 17.6c, less ton 18.2c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

**Manganese Metal:** (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Eastern Zone, carload, 2" x D, bulk 32c per lb of metal, carload packed 32.5c, ton lot 34c, less ton 36c; Central, add 1c for c.l. and 1.45c for l.c.l.; Western, add 1.45c for c.l. and 2.4c for l.c.l. Freight allowed. Spot, add 2c.

**Silicomanganese:** (Mn 65-70%). Eastern Zone, contract, lump, bulk, 1.50% C grade, 17-20% Si, 7.4c per lb of alloy, carload packed, 7.95c, ton lot 8.45c, less ton, 8.95c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. For 2.0% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

### CHROMIUM ALLOYS

**High-Carbon Ferrochrome:** Eastern Zone, contract, c.l., lump, bulk 17.6c per lb of contained Cr, c.l., packed 18.2c, ton lot 18.8c, less ton 19.5c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

**"SM" High-Carbon Ferrochrome:** (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

**Foundry Ferrochrome:** (Cr 62-66%, C 5-7%). Eastern Zone, contract, c.l., 8MxD, bulk 19.1c per lb of contained Cr, c.l., packed 19.7c, ton lot 20.4c, less ton 21.35c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

**Low-Carbon Ferrochrome:** (Cr 67-72%). Eastern Zone, contract, carload, lump, bulk, max. 0.03% C 27c per lb of contained Cr, 0.04% C 26c, 0.05% C 25.5c, 0.06% C 25c, 0.10% C 24.5c, 0.15% C 24.0c, 0.20% C 23.75c, 0.50% C 23.5c, 1% C 23.0c, 2% C 22.5c. Carload packed add 0.8c, ton lot add 1.35c, less ton add 2.35c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

**"SM" Low-Carbon Ferrochrome:** (Cr 62-66%, Si 4-6%, Mn 4-6%, and C 1.25% max.). Eastern Zone, contract, carload, lump, bulk 23c per lb of contained chromium, carload, packed 23.8c, ton lot 24.35c, less ton 25.35c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

**Low-Carbon Ferrochrome, Nitrogen Bearing:** Add 2c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 2c for each 0.25% of N above 0.75%.

**Chromium Metal:** (Min. 97% Cr and 1% Fe.). Eastern Zone, contract, carload, 1" x D, bulk, max. 0.50% C grade, 87c per lb of contained chromium, carload packed 88c, ton lot 89.5c, less ton 91.5c; Central, add 1.5c for c.l. and 2.5c for l.c.l.; Western, add 2.75c for c.l. and 4.5c for l.c.l. Freight allowed. Spot, add 5c.

### SILICON ALLOYS

**50% Ferrosilicon:** Eastern Zone, contract, carload, lump, bulk 8.8c per lb of contained Si, carload packed 10c, ton lot 10.65c, less ton 11.3c; Central, add 0.5c for c.l. and 1.25c for l.c.l.; Western, add 0.7c for c.l. and 1.8c for l.c.l. Freight allowed. Spot, add 0.45c.

**Low-Aluminum 50% Ferrosilicon:** (Al 0.40% max.). Add 1.3c to 50% Ferrosilicon prices.

**75% Ferrosilicon:** Eastern Zone, contract, carload, lump, bulk 11.2c per lb of contained Si, carload packed 12.25c, ton lot 12.85c, less ton 13.45c; Central, add 0.3c for c.l. and 0.75c for l.c.l.; Western, add 1.05c for c.l. and 5c for l.c.l. Freight allowed. Spot, add 0.3c.

**85% Ferrosilicon:** Eastern Zone, contract, carload, lump, bulk 12.7c per lb of contained Si, carload packed 13.7c, ton lot 14.25c, less ton 14.8c; Central, add 0.3c for c.l. and 0.7c for l.c.l.; Western, add 1.05c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

**Low-Aluminum 85% Ferrosilicon:** (Al 0.50% max.). Add 0.7c to 85% Ferrosilicon prices.

**90-95% Ferrosilicon:** Eastern Zone, contract, carload, lump, bulk, 14.35c per lb of contained Si, carload packed 15.35c, ton lot 15.85c, less ton 16.35c; Central, add 0.3c for c.l. and 0.65c for l.c.l.; Western, add 1c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

**Low-Aluminum 90-95% Ferrosilicon:** (Al 0.50% max.). Add 0.65c to above 90-95% Ferrosilicon prices.

**Silicon Metal:** (Over 97% Si and 1% max. Fe). Eastern Zone, c.l., lump, bulk, regular, 16.5c per lb of Si, c.l. packed 17.5c, ton lot 18c, less ton 18.5c; Central, add 0.6c for c.l. and 2.25c for l.c.l.; Western, add 1.2c for c.l. and 4c for l.c.l. Add 1c for max. 0.20% calcium grade. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing over 96% Si. Spot, add 0.25c.

**Alsifer:** (Approx. 20% Al, 40% Si, 40% Fe. Contract basis fob Niagara Falls, N. Y., lump per lb c.l. 6.50c; ton lots packed, 7c; 200 to 1999 lb, 7.75c; smaller lots, 8.25c. Spot up 0.5c.

### BRIQUETTED ALLOYS

**Chromium Briquets:** (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Eastern Zone, contract, carload, bulk, 11.1c per lb of briquet, carload packed 11.6c, ton lot 12c, less ton 12.4c; Central, add 0.25c for c.l. and 0.9c for l.c.l.; Western, add 0.35c for c.l. and 1.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

**Ferromanganese Briquets:** (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Eastern Zone, contract, carload, bulk, 8c per lb of briquet, c.l. packed, 8.6c, ton lot 9c, less ton 9.4c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

**Silicomanganese Briquets:** (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Eastern Zone, contract, c.l., bulk 7.65c per lb of briquet, c.l. packed 8.25c, ton lot 8.65c, less ton 9.05c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l., freight allowed. Add 0.25c for notching. Spot, add 0.25c.

**Silicon Briquets: (Large size**—weighing approx. 5 lb and containing exactly 2 lb of Si). Eastern Zone, contract, carload, bulk 4.65c per lb of briquet, c.l. packed 5.25c, ton lot 5.65c, less ton 6.05c. **(Small size**—weighing approx. 2½ lb and containing exactly 1 lb of Si). Eastern Zone, carload, bulk 4.8c, c.l. packed 5.4c, ton lot 5.8c, less ton 6.2c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.45c for c.l. and 0.9c for l.c.l. Freight allowed. Add 0.25c for notching, small size only. Spot, add 0.25c.

### CALCIUM ALLOYS

**Calcium-Manganese-Silicon:** (Ca 16-20%, Mn 14-18%, and Si 53-59%). Eastern Zone, contract, carload, lump, bulk 16.75c per lb of alloy, carload packed 17.35c, ton lot 18.85c, less ton 19.85c; Central, add 0.5c for c.l. and 0.85c for l.c.l.; Western, add 2.55c for c.l. and 2.6c for l.c.l. Freight allowed. Spot, add 0.25c.

**Calcium-Silicon:** (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Eastern Zone, contract, carload, lump, bulk 15.5c per lb of alloy, carload packed 16.5c, ton lot 18c, less ton 19c; Central, add 0.5c for c.l. and 0.75c for l.c.l.; Western, add 2.55c for c.l. and 2.90c for l.c.l. Freight allowed. Spot, add 0.25c.

### VANADIUM ALLOYS

**Ferrovanadium: Open Hearth Grade** (Va 50-55%, Si 8% max., C 3% max.). Eastern Zone, contract, any quantity, $2.90 per lb of contained Va; Central, add 2c for c.l. and 3c for l.c.l.; Western, add 6c for c.l. and 9c for l.c.l. Freight allowed. Spot, add 10c. **Special Grade** (Va 50-55%, Si 4% max., C 1% max.), $3. **High Speed Grade** (Va 50-55%, Si 1.50% max., C .20% max.), $3.10.

**Vanadium Oxide:** All Zones, contract, less carload lots, $1.20 per lb of contained $V_2O_5$. Spot, add 5c.

**Grainal:** Vanadium Grainal No. 1, 87.5c; No. 6, 60c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

### TITANIUM ALLOYS

**Ferrotitanium:** (Ti 20-25%, Al 3% max., Si 4% max., C 0.10% max.). Eastern Zone, contract, ton lot, 2" x D, $1.35 per lb of contained Ti, less ton $1.40. (Ti 40-45%, Al 7% max., Si 4% max., C 0.10% max.). Ton lot $1.23, less ton $1.25; Central, add 4c for 20-25% Ti grade, and 2.1c for 40-45% grade; Western, add 13.5c for 20-25% Ti grade, and 7.2c for 40-45% grade. Freight allowed. Spot, add 5c.

**Ferrotitanium, High-Carbon:** (15-20%). Contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

### TUNGSTEN ALLOYS

**Ferrotungsten:** (W 70-80%). Eastern Zone, contract, 10,000 lb W or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

**Tungsten Powder:** (W 98.8% min.). Eastern Zone, contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

### ZIRCONIUM ALLOYS

**12-15% Zirconium Alloy:** (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Eastern Zone, contract, c.l., lump, bulk 6c per lb of alloy, c.l. packed 6.55c, ton lot 6.9c, less ton 7.25c; Central, add 0.25c for c.l. and 1.1c for l.c.l.; Western, add 0.6c for c.l. and 3.95c for l.c.l. Freight allowed. Spot, add 0.25c.

**35-40% Zirconium Alloy:** (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Eastern Zone, contract, carload, lump, packed 18.4c per lb of alloy, ton lot 19.15c, less ton 20.4c; Central, add 0.6c for c.l. and 1.05c for l.c.l.; Western, add 3.05c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

### BORON ALLOYS

**Ferroboron:** (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Eastern Zone, contract, ton lots, 1" x D, $1.20 per lb of alloy, freight allowed. Less ton lots $1.30; Central, add 0.75c; Western, add 2.9c, freight allowed. Spot add 5c.

**Borosil:** (3 to 4% B, 40 to 45% Si). $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

**Bortam:** (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

**Carbortam:** (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

### OTHER FERROALLOYS

**Ferrocolumbium:** (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Eastern Zone, contract, ton lot, 2" x D, $2.50 per lb of contained Cb, less ton $2.55; Central, add 1.65c; Western, add 6.45c. Freight allowed. Spot, add 10c.

**CMSZ Mixes:** No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Eastern Zone, carload, 12 M x D, bulk 15.75c per lb of material, carload packed 16.5c, ton lot 17.25c, less ton 18c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

**Silcaz Alloy:** (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Eastern Zone, carload, packed, 1" x D, 37c per lb of alloy, ton lot 39c, less ton 41c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

**SMZ Alloy:** (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Eastern Zone, contract, carload, packed, ½" x 12 M, 14.3c per lb of alloy, ton lot 15.05c, less ton 15.8c; Central add 0.3c for c.l. and 1.1c for l.c.l.; Western add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed. Spot, add 0.25c.

**Simanal:** (Approx. 20% each Si, Mn, Al) Packed, lump, carload 9c, ton lots 9.25c, smaller lots 9.75c per lb alloy; freight not exceeding St. Louis rate allowed.

**Ferrophosphorus:** (17-19% based on 18% P content with unitage of $3 for each 1% of P above or below the base) Gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

**Ferromolybdenum:** (55-75%). Per lb, contained Mo, fob Langeloth and Washington Pa., furnace, any quantity 95.00c.

# WAA Metal Stocks Valued at $98.5 Million

*Disposal of $600 million worth in three years helped relieve critical shortages*

**NEW YORK** — During the past three years, War Assets Administration has channeled about $600 million worth of war-surplus metals and valves and fittings into the peacetime economy. WAA received from May 15, 1944, to Aug. 31, 1947, metals and valves and fittings totaling more than $700 million in acquisition cost and had on the latter date an inventory of $98,465,000. This inventory consists of iron and steel products, 54 per cent; nonferrous metals, 18 per cent; and valves and fittings, 28 per cent.

About 100,000 short tons of surplus copper, and sizable quantities of tin, lead, and zinc, originally scheduled for stockpiling, were released instead to industry to relieve a critical short supply.

**COPPER** — Output of copper from United States mines in 1947 to 1952 at current or somewhat lower prices is expected to fall short of the expected needs of the domestic industry in that period by about 1 million short tons, according to Secretary of Interior Krug's report on national resources and foreign aid. Domestic mine production is estimated to be 900,000 short tons in 1947 and then to decline to an average of 825,000 tons per year from 1950 to 1952. Consumption for the same period probably will approximate 1,250,000 and 950,000 tons, respectively, the report said.

Production from foreign mines in 1946 was at little more than two-thirds of their aggregate capacity as measured by recent peak outputs. "Resumption of and maintenance of capacity production levels at home and abroad," the report said, "for two or three years, would change the present world deficit to a surplus. Current rates of domestic demand for copper constitute a considerable drain on known United States reserves but the quantity of domestic metal likely to be required for the foreign rehabilitation program is inconsequential in terms of domestic resources."

The report also pointed out that the continuation of the present copper-aluminum price relationship will encourage a larger-scale substitution of aluminum for copper. Copper prices passed those for aluminum in November, 1946, and are now about 6 cents higher.

The domestic market continued firm last week with demands for November shipment not fully satisfied, despite the absence of pressure from the brass mills.

**LEAD** — Total stocks of refined lead held by the Office of Metals Reserve as of Sept. 30 amounted to only 4650 tons. During the last few months requests for allotments from the government stockpile have been few because of the improvement in supplies which resulted in the majority of consumers receiving more metal. However, sellers report they could dispose of additional lead if it were available. Production during the first eight months of 1947 amounted to 248,324 tons compared with 223,436 tons in the like 1946 period, an increase of about 11 per cent, according to the Bureau of Mines.

**ZINC** — Statistical position of the zinc market has been improved by the removal of 63,411 tons of slab zinc from stocks held by the Office of Metals Reserve to the permanent government stockpile held by the Army and Navy Munitions Board. Mine production in the United States during the first eight months of 1947 amounted to 433,395 tons, an increase of about 66,500 tons, or 18 per cent, over the 366,953 tons produced in the like 1946 period.

New York delivered prices have advanced 6 points due to the 10 per cent increase in freight rates. The market is quoted 11.06c for prime western, 11.31c for brass special and 11.56c for intermediate grade zinc, delivered New York.

**TIN** — Office of Metals Reserve's stocks of pig tin increased about 4250 tons during the third quarter to a total of 16,356 tons. During September, imports totaled 5764 tons; smelter production, 2356; and allocations 4875 tons.

**PLATINUM** — Platinum prices increased $3 an ounce last week to $62, wholesale; $65, retail. The advance was attributed to improved demand from the jewelry trade and industrial users.

# NONFERROUS METAL PRICES

**Copper:** Electrolytic, carlots 21.50c, delivered Conn.; Lake, 21.62½c del. Conn. Dealers may add ¾c for 5000 lb to carload; 1c 1000-4999 lb; 1½c, 500-999 lb; 2c 0-499 lb. Casting, nom., refinery, 20,000 lb or more; nom., less than 20,000 lb.

**Brass Ingot:** 85-5-5-5 (No. 115) 17.50c-18.00c; 88-10-2 (No. 215) 25.75-26.25c; 80-10-10 (No. 305) 21.50-22.00c; No. 1 yellow (No. 405) 13.75-14.50c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than carloads.

**Zinc:** Prime western 10.50c, brass special 10.75c, intermediate 11.00c, E. St. Louis; high grade 11.50c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c.

**Lead:** Common 14.80c-14.85c, chemical 14.90c, corroding 14.90c, E. St. Louis for carlots.

**Primary Aluminum:** 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ½c 2000-9999 lb; 1c less through 2000 lb.

**Secondary Aluminum:** Piston alloy (No. 122 type) 14.00-14.50c; No. 12 foundry alloy (No. 2 grade) 13.75c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97½%) 14.50c; grade 2 (92-95%) 12.75c; grade 3 (90-92%) 12.00-12.25c; grade 4 (85-90%) 11.50-11.75c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1¼c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

**Magnesium:** Commercially pure (99.8%) standard ingots (4-notch, about 20 lb), 10,000 lb and over, 20.50c; 2000 to 9999 lb, 21.50c; 100 to 1999 lb, 22.50c. Extruded rounds, 12 inches long, 1.312 inches in diameter, less than 25 lb, 52.00c-56.00c; 25 to 99 lb, 42.00c-46.00c; 100 to 4000 lb, 35.00c-36.00c.

**Tin:** Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straits), 80.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 79.85c; Grade C, 99.65-99.79% incl. 79.55c; Grade D, 99.50-99.64% incl., 79.40c; Grade E, 99-99.49% incl. 78.90c; Grade F, below 99% (for tin content), 78.70c.

**Antimony:** American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 33.00c; 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 33.50c, effective as of Mar. 15. On producers' sales add ¼c for less than carload to 10,000 lb; ½c for 224-999 lb; add 2c for 223 lb and less; on sales by dealers, distributors, and jobbers add ½c, 1c, and 3c, respectively.

**Nickel:** Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked 35.00c lb; 25 lb pigs produced from electrolytic cathodes 36.50c lb; shot produced from electrolytic cathodes 37.50c lb; "F" nickel shots or ingots for additions to cast iron 35.50c lb. Prices include import duty.

**Mercury:** Open market, spot, New York, $81-$84 per 76-lb flask.

**Beryllium-Copper:** 3.75-4.25% Be, $17 per lb contained Be.

**Cadmium:** Bars, ingots, pencils, pigs, plates rods, slabs, sticks, and all other "regular" straight or flat forms $1.75 lb, del.; anodes, balls, discs and all other special or patented shapes, $1.80.

**Cobalt:** 97-98%, $1.65 lb for 550 lb (keg) $1.67 lb for 100 lb (case); $1.72 lb under 100 lb.

**Gold:** U. S. Treasury, $35 per ounce.

**Indium:** 99.9%, $2.25 per troy ounce.

**Silver:** Open market, N. Y., 71.37½c, per ounce.

**Platinum:** $62-$65 per ounce.

**Palladium:** $24 per troy ounce.

**Iridium:** $80-$90 per troy ounce.

## Rolled, Drawn, Extruded Products

Copper and brass products prices based on 21.50c, Conn., for copper. Freight prepaid on 100 lb or more).

**Sheet:** Copper 33.68c; yellow brass 29.63c; commercial bronze, 95% 33.72c, 90% 33.11c, red brass, 85% 31.99c, 80% 31.38c; best quality 30.64c; Everdur, Duronze, Herculoy or equiv., cold-drawn, 38.46c; nickel silver, 18%, 42.49c; phosphor bronze, grade A, 5%, 52.00c.

**Rods:** Copper, hot rolled 30.03c, cold drawn 31.03c; yellow brass, free cutting, 24.39c; commercial bronze, 95% 33.41c, 90% 32.80c; red brass, 85% 31.68c, 80% 31.07c; best quality 30.33c.

**Seamless Tubing:** Copper 33.72c; yellow brass 32.39c; commercial bronze 90% 35.52c; red brass 85% 34.65c, 80% 34.04c; best quality brass 33.05c.

**Wire:** Yellow brass 29.92c; commercial bronze, 95% 34.01c, 90% 33.40c; red brass, 85% 32.28c, 80% 31.67c; best quality brass 30.93c. **Copper Wire:** Bare, soft, fob eastern mills, carlots 26.92c, less carlots 27.42c; weatherproof, fob eastern mills carlots 27.60c, less carlots 28.10c; magnet, delivered, carlots 29.75c-31.13c, 15,000 lb or more 30.00c-31.38c, less carlots 30.50c-31.88c.

**Aluminum Sheets and Circles:** 2s and 3s flats, mill finish, base 30,000 lb or more, fob shipping point. Actual transportation charges (not to exceed lowest carload rail freight rate) are deducted on orders for domestic delivery of 500 lb or more of one product to one destination. Widths from 12 in. and diameters from 9 in. to indicated maximum sizes. Prices, cents per lb, effective Jan. 30, 1947.

| B. & S. Gage | Max. Width or Diam. | Sheet Base | Circle Base |
|---|---|---|---|
| 0.0249"-7 | 48" | 23.70 | 26.20 |
| 8-10 | 48" | 24.20 | 26.70 |
| 11-12 | 26" | 24.70 | 27.50 |
| 13-14 | 26" | 24.90 | 27.90 |
| 15-16 | 26" | 25.10 | 28.20 |
| 17-18 | 26" | 25.40 | 28.60 |
| 19-20 | 24" | 25.70 | 29.00 |
| 21-22 | 24" | 26.10 | 29.50 |
| 23-24 | 24" | 26.60 | 30.20 |
| 25 | 24" | 27.10 | 30.90 |
| 26 | 24" | 27.80 | 31.90 |
| 27 | 24" | 28.50 | 33.00 |
| 28 | 24" | 29.20 | 33.70 |
| 29 | 24" | 30.00 | 34.70 |
| 30 | 24" | 30.80 | 35.80 |

**Lead Products:** Prices to jobbers: Sheets, full rolls, 140 sq ft or more, 18.25c; add per hundredweight, 25c, 80 to 140 sq ft; 50c, 20 to 80 sq ft; 75c, 10 to 20 sq ft and circles. Pipe: Full coils 17.50c; cut coils 17.75c. Lead Traps and Bends: List plus 42%.

**Zinc Products:** Sheet, 15.50c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 14.50c, fob mill, 36,000 lb and over. Plates, not over 12-in., 13.50c; over 12-in., 14.50c.

## Plating Materials

**Chromic Acid:** 99.75%, flake, fob Philadelphia, carloads, 21.00c; 5 tons and over 21.50c; 1 to 5 tons, 22.00c; less than 1 ton, 22.50c.

**Copper Anodes:** Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 30.59c; oval, 30.09c; electrodeposited, 29.84c; cast, 29.59c.

**Copper Carbonate:** 52-54% metallic Cu, 50 lb bags, 26.50c.

**Copper Cyanide:** 70-71% Cu, 100-lb drums, 45.00c fob Cleveland.

**Sodium Cyanide:** 96-98%, ½-oz ball, in 100 or 200 lb drums, 1 to 400 lb, 16.00c, 500 lb and over, 15.00c, fob Cleveland; 1 cent less, fob Niagara Falls.

**Nickel Anodes:** Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c; 3000 to 10,000 lb, 50.00c; 500 to 3000 lb, 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; add 1 cent for rolled depolarized.

**Nickel Chloride:** 100-lb kegs, 22.00c; 275-lb bbls, 20.00c.

**Tin Anodes:** Bar, 1000 lb and over 92.50c; 500 to 1000 lb, 93.00c; 200 to 500 lb, 93.50c; less than 200 lb, 95.00c; ball, 1000 lb and over, 94.75c; 500 to 1000 lb, 95.25c; 200 to 500 lb, 95.75c; less than 200 lb, 97.25c, fob Sewaren, N. J.

**Tin Chloride:** Fob Grasselli, N. J., 625 lb bbls., price on application.

**Sodium Stannate:** To all consumers: in 200 or 500 lb drums, 49.50c; 100 lb, 50.50c; 50 lb, 55.00c; 25 lb, 57.50c.
To consumers other than automobile, radio and refrigerator makers: 1500 lb, 45.85c; 600 to 1400 lb, 48.50c.
To automobile, radio and refrigerator makers: 10,000 lb and over, 44.50c; 2000 to 9999 lb, 45.50c; 1000 to 1999, 46.50c; 600 to 999 lb, 48.50c.

**Zinc Cyanide:** 100-lb drums 36.00c, fob Cleveland; 35.00c, fob Niagara Falls.

## Scrap Metals

### BRASS MILL ALLOWANCES

(Based on 21.50c, Conn., for copper)
Prices for less than 15,000 lb fob shipping point. Add ¾c for 15,000-40,000 lb; 1c for 40,000 or more.

| | Clean Heavy | Rod Ends | Clean Turnings |
|---|---|---|---|
| Copper | 19.125 | 19.125 | 18.375 |
| Yellow brass | 15.125 | 14.875 | 14.250 |
| Commercial Bronze | | | |
| 95% | 18.000 | 17.750 | 17.250 |
| 90% | 17.500 | 17.250 | 16.750 |
| Red brass | | | |
| 85% | 17.250 | 17.000 | 16.500 |
| 80% | 16.875 | 16.625 | 16.125 |
| Best Quality (71-79%) | 16.125 | 15.875 | 15.375 |
| Muntz Metal | 14.125 | 13.875 | 13.375 |
| Nickel silver, 5% | 16.125 | 15.875 | 8.063 |
| Phos. bronze, A, B | 20.000 | 19.750 | 18.750 |
| Naval brass | 14.500 | 14.250 | 13.750 |
| Manganese bronze | 14.500 | 14.250 | 13.625 |

### BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 17.00, No. 2 copper 15.50-16.00, light copper 14.50-15.00, composition red brass 12.75-13.00, auto radiators 9.75, heavy yellow brass 9.00, brass pipe 10.00.

### REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 18.00-18.25, No. 2 copper 16.50-16.75, light copper, 15.50-15.75, refinery brass (60% copper), per dry copper content less $5 smelting charge for brass analyzing 60 per cent or more, 12.625.

### DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

**Copper and Brass:** Heavy copper and wire No. 1 16.00, No. 2 15.00, light copper 14.00, No. 1 composition red brass 11.00, No. 1 composition turnings 10.00-10.50, mixed brass turnings 5.50-6.00, new brass clippings nom. 10.50-11.00, No. 1 brass rod turnings 9.00-9.50, light brass 5.00-5.50, heavy yellow brass 6.00-6.50, new brass rod ends 9.00-9.50, auto radiators, unsweated 8.50-9.00, cocks and faucets 8.00-8.25, brass pipe 8.00-8.25.

**Lead:** Heavy 11.50, battery plates 6.25-6.50, linotype and stereotype 12.25-12.50, electrotype 10.75-11.00, mixed babbitt 10.75-11.00, solder joints 15.50-16.00.

**Zinc:** Old zinc 5.00, new die cast scrap 3.50, old die cast scrap 2.00-2.50.

**Tin:** No. 1 pewter 50.00-52.00, block tin pipe 67.00-68.00, auto babbitt 40.00-42.00, No. 1 babbitt 40.00-43.00, siphon tops 40.00-42.00.

**Aluminum** clippings, 2S 8.00-8.50, old sheets 6.00-6.50, crankcases 6.00-6.50, borings and turnings 2.00-2.50, pistons, free of struts, 5.00-5.50.

**Nickel:** Anodes 16.00-17.00, turnings 12.50-13.00, rod ends 16.00-17.00.

**Monel:** Clippings 12.00-12.50, turnings 7.00-7.25, old sheets 10.00-10.50, rods 10.00-10.50, castings 9.00.

# OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

### PITTSBURGH

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $43.00 |
| No. 2 Heavy Melt. Steel | 43.00 |
| No. 1 Busheling | 43.00 |
| Nos. 1, 2 and 3 Bundles | 43.00 |
| Machine Shop Turnings | 35.50-36.00 |
| Mixed Borings, Turnings | 35.50-36.00 |
| Short Shovel Turnings | 37.00-38.00 |
| Cast Iron Borings | 36.00-37.00 |
| Bar Crops and Plate | 47.00-48.00 |
| Low Phos. Steel | 47.00-48.00 |
| Punchings & Plate Scrap | 47.00-48.00 |
| Cut Structurals | 47.00-48.00 |
| Elec. Furnace Bundles | 45.00-48.00 |
| Heavy Turnings | 39.50-40.50 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola | 45.00-46.00 |
| Charging Box Cast | 41.00-42.00 |
| Heavy Breakable Cast | 38.50-39.00 |
| Stove Plate | 39.50-40.00 |
| Unstripped Motor Blocks | 41.00-42.00 |
| Malleable | 52.00-53.00 |
| Brake Shoes | 37.00-38.00 |
| Clean Auto Cast | 46.00-47.00 |
| No. 1 Wheels | 48.50-49.50 |
| Burnt Cast | 35.00-36.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 42.50-43.00 |
| R.R. Malleable | 52.00-53.00 |
| Axles | 49.00-50.00 |
| Rails, Rerolling | 52.00-53.00 |
| Rails, Random Lengths | 49.00-49.50 |
| Rails, 3 ft and under | 50.00-51.00 |
| Rails, 18 in. and under | 51.50-52.00 |
| Railroad Specialties | 50.00-51.00 |
| Uncut Tires | 49.00-50.00 |
| Angles, Splice Bars | 50.00-51.00 |

### CLEVELAND

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $40.75-43.00 |
| No. 2 Heavy Melt. Steel | 40.75-43.00 |
| No. 1 Busheling | 40.75-43.00 |
| Nos. 1 & 2 Bundles | 40.75-43.00 |
| Machine Shop Turnings | 33.00-33.50 |
| Mixed Borings, Turnings | 33.50-34.00 |
| Short Shovel Turnings | 33.50-34.00 |
| Cast Iron Borings | 33.50-34.00 |
| Bar Crops and Plate | 44.00-45.00 |
| Punchings & Plate Scrap | 44.00-45.00 |
| Heavy Turnings | 39.00-41.00 |
| Alloy Free Turnings | 37.00-39.00 |
| Cut Structurals | 47.00-48.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola | 49.00-50.00 |
| Charging Box Cast | 43.50-44.50 |
| Stove Plate | 43.00-43.50 |
| Heavy Breakable Cast | 41.00 |
| Unstripped Motor Blocks | 46.00 |
| Malleable | 60.00-62.00 |
| Brake Shoes | 44.00 |
| Clean Auto Cast | 48.00-50.00 |
| No. 1 Wheels | 44.00 |
| Burnt Cast | 42.50-43.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 46.00-47.00 |
| R.R. Malleable | 60.00-62.00 |
| Rails, Rerolling | 50.00 |
| Rails, Random Lengths | 46.00-47.00 |
| Rails, 3 ft and under | 48.00-50.00 |
| Cast Steel | 48.00-48.50 |
| Railroad Specialties | 48.00-48.50 |
| Uncut Tires | 43.00-43.50 |
| Angles, Splice Bars | 48.00-50.00 |

### VALLEY

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $42.50-43.50 |
| No. 2 Heavy Melt. Steel | 41.50-42.50 |
| No. 1 Bundles | 42.50-43.50 |
| Machine Shop Turnings | 36.00-37.00 |
| Short Shovel Turnings | 38.00-39.00 |
| Cast Iron Borings | 34.00-35.00 |
| Low Phos. | 46.50-47.50 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 46.50-47.50 |

### MANSFIELD

| | |
|---|---|
| Machine Shop Turnings | 36.50 |
| Short Shovel Turnings | 37.00-38.50 |

### CINCINNATI

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $41.00 |
| No. 2 Heavy Melt. Steel | 41.00 |
| No. 1 Busheling | 41.00 |
| No. 1 Bundles | 41.00 |
| No. 2 Bundles | 41.00 |
| Machine Shop Turnings | 35.00 |
| Mixed Borings, Turnings | 34.00 |
| Short Shovel Turnings | 37.00 |
| Cast Iron Borings | 36.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 48.00 |
| Charging Box Cast | 40.00 |
| Heavy Breakable Cast | 42.00 |
| Stove Plate | 40.00 |
| Unstripped Motor Blocks | 39.00 |
| Brake Shoes | 36.00 |
| Clean Auto Cast | 47.00 |
| Drop Broken Cast | 50.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 42.00 |
| R.R. Malleable | 58.00 |
| Rails, Rerolling | 48.50 |
| Rails, Random Lengths | 46.50 |
| Rails, 18 in. and under | 51.00 |

### DETROIT

(Dealers buying prices, fob shipping point)

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $37.50-38.00 |
| No. 1 Busheling | 37.50-38.00 |
| Nos. 1 & 2 Bundles | 37.50-38.00 |
| No. 3 Bundles | 37.50-38.00 |
| Machine Shop Turnings | 31.50-32.00 |
| Mixed Borings, Turnings | 31.50-32.00 |
| Short Shovel Turnings | 32.50-33.00 |
| Cast Iron Borings | 32.50-33.00 |
| Punchings & Plate Scrap | 43.00-44.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 45.00-46.00 |
| Heavy Breakable Cast | 38.00-39.00 |
| Clean Auto Cast | 45.00-46.00 |

### BUFFALO

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $39.00-40.00 |
| No. 2 Heavy Melt. Steel | 37.00-38.00 |
| No. 1 Busheling | 37.00-38.00 |
| No. 1 & 2 Bundles | 37.00-38.00 |
| Machine Shop Turnings | 32.00-33.00 |
| Mixed Borings, Turnings | 32.00-33.00 |
| Cast Iron Borings | 32.00-33.00 |
| Short Shovel Turnings | 33.00-34.00 |
| Low Phos. | 43.00-44.00 |
| Elec. Furnace Bundles | 41.50-42.50 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 43.00-44.00 |
| Heavy Breakable Cast | 37.00-38.00 |
| Malleable | 52.00-55.00 |
| No. 1 Wheels | 43.00-44.00 |

Railroad Scrap

| | |
|---|---|
| Rails, 3 ft and under | 47.00-47.50 |
| Railroad Specialties | 48.00-49.00 |

### PHILADELPHIA

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $42.00 |
| No. 2 Heavy Melt. Steel | 43.00 |
| No. 1 Busheling | 43.00 |
| No. 1, No. 2 Bundles | 43.00 |
| No. 3 Bundles | 40.00 |
| Machine Shop Turnings | 33.50 |
| Mixed Borings, Turnings | 33.50 |
| Short Shovel Turnings | 35.00 |
| Bar Crop and Plate | 46.50-47.50 |
| Punchings & Plate Scrap | 46.50-47.50 |
| Cut Structurals | 46.50-47.50 |
| Elec. Furnace Bundles | 44.50 |
| Heavy Turnings | 43.00 |
| No. 1 Chemical Borings | 36.00-37.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 48.00-49.00 |
| No. 1 Machinery Cast | 50.00-52.00 |
| Charging Box Cast | 48.00-49.00 |
| Heavy Breakable Cast | 48.00-49.00 |
| Unstripped Motor Blocks | 45.00-46.00 |
| Malleable | 58.00-60.00 |
| Clean Auto Cast | 50.00-51.00 |
| No. 1 Wheels | 49.00-50.00 |

### NEW YORK

(Dealers buying prices, fob shipping point)

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $38.00 |
| No. 2 Heavy Melt. Steel | 38.00 |
| No. 1 Busheling | 38.00 |
| Nos. 1 & 2 Bundles | 38.00 |
| No. 3 Bundles | 36.00 |
| Machine Shop Turnings | 29.00-30.00 |
| Mixed Borings, Turnings | 29.00-30.00 |
| Short Shovel Turnings | 31.00-33.00 |
| Punchings & Plate Scrap | 40.00 |
| Cut Structurals | 40.00 |
| Elec. Furnace Bundles | 40.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 43.00-44.00 |
| Charging Box Cast | 43.00-44.00 |
| Heavy Breakable | 43.00-44.00 |
| Unstripped Motor Blocks | 40.00 |
| Malleable | 54.00-55.00 |

### BOSTON

(Fob shipping point)

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $38.00-38.50 |
| No. 2 Heavy Melt. Steel | 36.00-36.50 |
| No. 1 Bundles | 36.50-37.00 |
| No. 1 Busheling | 36.00-37.00 |
| Machine Shop Turnings | 31.50-32.50 |
| Mixed Borings, Turnings | 37.00-38.00 |
| Short Shovel Turnings | 37.00-38.00 |
| Bar Crops and Plate | 37.00-38.00 |
| Punchings & Plate Scrap | 37.00-38.00 |
| Chemical Borings | 28.00-29.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 42.00-44.00 |
| Charging Box Cast | 38.00-39.00 |
| Heavy Breakable Cast | 38.00-39.00 |
| Stove Plate | 38.00-39.00 |
| Unstripped Motor Blocks | 36.00-37.00 |
| Clean Auto Cast | 40.00-42.00 |

### CHICAGO

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $42.50-43.00 |
| No. 2 Heavy Melt. Steel | 42.50-43.00 |
| Nos. 1 & 2 Bundles | 42.50-43.00 |
| No. 3 Bundles | 40.50-41.00 |
| Machine Shop Turnings | 36.00-36.50 |
| Mixed Borings, Turnings | 36.00-36.50 |
| Short Shovel Turnings | 39.00-39.50 |
| Cast Iron Borings | 37.00-37.50 |
| Bar Crops and Plate | 44.50-45.00 |
| Cast Steel | 44.50-45.00 |
| Punchings | 44.50-45.00 |
| Elec. Furnace Bundles | 43.50-44.00 |
| Heavy Turnings | 42.00-42.50 |
| Cut Structurals | 44.50-45.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 48.00-49.00 |
| Malleable | 48.00-49.00 |
| Clean Auto Cast | 48.00-49.00 |
| No. 1 Wheels | 45.00-46.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 46.00-47.00 |
| Malleable | 62.00-63.00 |
| Rails, Rerolling | 54.00-55.00 |
| Rails, Random Lengths | 47.00-48.00 |
| Rails, 3 ft and under | 52.00-53.00 |
| Rails, 18 in. and under | 53.00-54.00 |
| Railroad Specialties | 48.00-49.00 |
| Angles, Splice Bars | 48.00-49.00 |

### ST. LOUIS

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $39.00-40.00 |
| No. 2 Heavy Melt. Steel | 36.00-37.00 |
| Machine Shop Turnings | 32.00-33.00 |
| Short Shovel Turnings | 33.00-34.00 |

Cast Iron Grades

(Fob shipping point)

| | |
|---|---|
| No. 1 Cupola Cast | 42.00-43.00 |
| Charging Box Cast | 39.00-40.00 |
| Heavy Breakable Cast | 35.00-36.00 |
| Brake Shoes | 40.00-41.00 |
| Clean Auto Cast | 42.00-43.00 |
| Burnt Cast | 35.00-37.00 |

Railroad Scrap

| | |
|---|---|
| R.R. Malleable | 58.00-60.00 |
| Rails, Rerolling | 48.00-49.00 |
| Rails, Random Lengths | 42.00-43.00 |
| Rails, 3 ft and under | 48.00-50.00 |
| Uncut Tires | 43.50-44.50 |
| Angles, Splice Bars | 46.00-47.00 |

### BIRMINGHAM

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $34.00-35.00 |
| No. 2 Heavy Melt. Steel | 34.00-35.00 |
| No. 1 Busheling | 34.00-35.00 |
| Nos. 1 & 2 Bundles | 34.00-35.00 |
| No. 3 Bundles | 31.00 |
| Long Turnings | 24.50 |
| Short Shovel Turnings | 26.00-27.00 |
| Cast Iron Borings | 25.00 |
| Bar Crops and Plate | 38.50 |
| Cut Structurals | 38.50 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 41.00 |
| Stove Plate | 39.00 |
| No. 1 Wheels | 36.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 37.00 |
| R.R. Malleable | 42.50 |
| Axles, Steel | 39.00 |
| Rails, Rerolling | 41.00 |
| Rails, Random Length | 39.00 |
| Rails, 3 ft and under | 41.00 |
| Angles and Splice Bars | 41.00 |

### SAN FRANCISCO

| | |
|---|---|
| No. 1 Heavy Melt. Steel | *$22.00 |
| No. 2 Heavy Melt. Steel | *22.00 |
| No. 1 Busheling | *22.00 |
| Nos. 1 & 2 Bundles | *22.00 |
| No. 3 Bundles | *17.00 |
| Machine Shop Turnings | *12.50 |
| Bar Crops and Plate | 22.00 |
| Cast Steel | 22.00 |
| Alloy Free Turnings | 12.50 |
| Cut Structurals | 22.00 |
| Tin Can Bundles | 17.00 |

Railroad Scrap

| | |
|---|---|
| Axles | 29.00 |
| Rails, Random Lengths | 23.50 |
| Uncut Tires | 30.50 |

*Fob California shipping point.

### SEATTLE

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $22.00 |
| No. 2 Heavy Melt. Steel | 22.00 |
| No. 1 Busheling | 22.00 |
| Nos. 1 & Bundles | 22.00 |
| No. 3 Bundles | 20.00 |
| Machine Shop Turnings | 13.50 |
| Mixed Borings, Turnings | 13.50 |
| Punchings & Plate Scrap | 23.50 |
| Cut Structurals | 23.50 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 27.50 |
| Charging Box Cast | 22.50 |
| Heavy Breakable Cast | 21.50 |
| Stove Plate | 23.00 |
| Unstripped Motor Blocks | 21.50 |
| Malleable | 27.50 |
| Brake Shoes | 27.50 |
| Clean Auto Cast | 27.50 |
| No. 1 Wheels | 24.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 20.00 |
| Railroad Malleable | 27.50 |
| Rails, Random Lengths | 20.00 |
| Angles and Splice Bars | 21.50 |

### LOS ANGELES

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $22.50 |
| No. 2 Heavy Melt. Steel | 22.50 |
| Nos. 1 & 2 Bundles | 22.50 |
| Machine Shop Turnings | 16.00 |
| Mixed Borings, Turnings | 15.50-16.00 |
| Punchings & Plate Scrap | 28.00 |
| Elec. Furnace Bundles | 28.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 35.00-36.00 |

# LOGEMANN

# Presses for Sheet Scrap

## THE NATION NEEDS YOUR SHEET SCRAP!

In mills, industrial plants and scrap yards, LOGEMANN SCRAP PRESSES are working day and night to prepare sheet scrap for the furnaces.

Sheet mills particularly recognize the value of the years of experience and the performance records which back up LOGEMANN designs and workmanship.

The line includes scrap presses *designed for mill Service,* presses *designed for automobile plant conditions,* presses *designed for general plant applications.* Write for details.

**LOGEMANN BROTHERS COMPANY**
**3126 W. Burleigh St.** **Milwaukee, Wisconsin**

The scrap press illustrated operates in one of the largest industrial plants. Compresses scrap from three directions to produce high-density mill size bundles. Built in various capacities.

## Sheets, Strip . . .

*Record output fails to relieve pressure for delivery of flat-rolled items*

Sheet Prices, Page 126

**Pittsburgh** — October output of sheets and strip is headed for a new monthly record, but despite this encouraging production pace sellers report no easing in pressure for deliveries. It is improbable much if any headway can be made against substantial mill carryover tonnages without reducing customers' monthly allotments this quarter. Some sellers are "blocking out" December rolling schedules for this purpose.

Indicative of the industry's effort to meet pent-up demand for flat-rolled steel products is recent announcement of Carnegie-Illinois Steel Corp. to effect that facilities to increase annual output at the Irvin Works by 300,000 tons are now under construction. New pickling, cold-reducing, annealing, temper rolling, shearing and tin coating facilities are being provided. Galvanizing sheet output at company's Vandergrift plant is expected to be concentrated at the Irvin Works with overall capacity eventually increased with installation of a continuous galvanizing line.

**Boston**—Shortages in carbon sheets are more acute and more users are turning to strip steel—when they can get it. To meet requirements for cold-rolled strip, producers are hampered by lower allocations and unbalanced inventories of hot-rolled. First quarter schedules for numerous high carbon items are filling rapidly and little or no dent is being made in backlogs. Narrow cold strip production schedules are frequently subject to revisions, primarily due to lack of balance in steel for cold-finishing. With some producers withdrawn on hot-rolled, sources of supply have narrowed. Volume of cold strip going into chain manufacture is substantial. Current receipts of most grades of sheets are against old orders, and, in some cases, it appears doubtful mills will be able to ship a high percentage of reduced fourth quarter allocations. Flat-rolled is short now, but it probably will be tighter at the yearend.

**New York** — One sheet producer, selling on a month-to-month basis, has entered orders for January rolling, this being the first reported case of new orders scheduled beyond the end of the year by any of the leading producers. Some major producers indicate they will open their books for first quarter early in November, while others assert that they may not do much before the middle of that month, allowing themselves as much time as possible to gage the yearend carryover.

**Philadelphia** — Most sheet sellers expect to have first quarter quotas set up by mid-November while some will take earlier action. One large producer has opened books for January delivery. While demand continues active for all grades, except for certain specialties, sellers see little letup for months to come, even though new facilities will gradually widen capacity.

**Buffalo** — Despite increased output, producers have been unable to narrow the extended future delivery dates on sheets and strip. Bethlehem's sheet and strip mill in Lackawanna is constantly breaking month-to-month production records with current runs in excess of 100,000 tons a month. Production will be stepped up to 125,000 tons a month within the next half year by the addition of a new coiler.

**Cleveland** — Seeing no near-term easing in demand for light-gage flat-rolled products, one steel producer is abandoning quarterly quotas and replacing them with a monthly quota system for hot and cold-rolled carbon sheets and strip. The producer believes that setting of quotas once every month will facilitate keeping them in line with production. In using a quarterly plan the producer has found many interruptions to production can occur meanwhile to prevent meeting quotas. Continued excess of demand over supply in light-gage, flat-rolled products is accompanied by a constant flow of steel-seeking consumers to steel company sales offices. Seriousness of the problem may be judged from the fact many of the visitors are no less than company presidents who hope their prestige will bring forth steel, particularly sheets.

**Cincinnati**—Sheet mills are under pressure for first quarter delivery positions, but are holding to previously established policy of delaying commitments until the prospective carryover may be estimated more accurately. Demand appears heavier than ever, surpassing that of war years. Some inquiries are being received from customers of other mills whose sources of supply have been affected by freight rate increases. Books are already jammed so that mills are not in position to give much, if any, help.

**Chicago** — Demand for sheets and strip is continuing unabated and consumers are pressing for deliveries. At the same time, mills are being beset for information on quotas for first quarter, 1948. One important producer probably will open books for next year within a week or ten days. Another sheetmaker, who is running almost a full quarter behind in deliveries, is notifying customers that since it is still shipping against third quarter orders, it proposes to push its fourth quarter commitments over to first quarter. Customers have the option to approve this procedure or to cancel out their fourth quarter tonnage and submit new specifications against their first quarter quotas. Other mills previously had cut fourth quarter quotas sharply. It is reported that a mail order house has placed an initial order for aluminum gutters and downspouts because of inability to obtain galvanized steel. In some cases where cost can be absorbed, manufacturers are substituting stainless for galvanized.

**Birmingham**—The district continues to put great productive effort on sheets. Output is substantial and approaches capacity, but it is not sufficient for current and prospective needs. Sheet users continue to complain about supplies and are pressing, without much result, for accelerated deliveries. A good volume of strip, consisting of cotton ties, barrel hoops and miscellaneous strip is being produced.

## Steel Bars . . .

*Producers start opening books on hot-rolled carbon bars for first quarter*

Bar Prices, Page 126

**New York** — One leading independent producer is now opening books for first quarter on hot-rolled carbon bars, and another contemplates similar action within the next week to ten days. Quotas will be set up for regular customers as heretofore, although they may be subject to adjustment as the yearend approaches and a better measure can be taken of the possible carryover at that time.

On cold-carbon bars, books have long since been opened for next year by most producers. Demand for cold-drawn has not been pressing for some time and sellers have been disposed to book such tonnage as has been offered regardless of future delivery desired —at least most have been willing to accept tonnage for delivery throughout the first half, with some even accepting tonnage for third quarter.

**Boston** — While there are exceptions, more consumers have better balanced inventories of carbon bars, notably cold-finished. Bolt and nut shops are plagued by lack of some sizes, but textile machinery builders and miscellaneous users are buying more generally on a replacement basis. Warehouse supply of cold finished bars, narrow flats excepted, is sufficient to meet demand in most cases. Antifriction bearing manufacturers are well supplied with alloys; indeed, this group of steel consumers seems to have had less material worries right along than most users. Carryovers in carbon bars will be lighter than for most standard products at the yearend with some indication mills will further reduce the margin by the end of this quarter; some producers' carryovers now approximate three weeks rolling. With new volume booked for December limited, determined efforts are being made to go into the new year with a minimum of delinquent tonnage.

**Philadelphia** — One large producer of hot-rolled carbon bars has set up quotas for first quarter, with others expected to follow soon. Producers likely will have a fairly good carryover, especially on the small and medium sizes, although not quite as much as marked the beginning of the present period. Demand for cold-drawn bars and for the larger sizes of hot-rolled bars continues on the easy side, and this eventually should improve the supply situation for those bar types now short.

**Pittsburgh** — First-quarter allotments for merchant carbon bars have been slightly reduced reflecting a correction of previous over-optimistic mill estimates of monthly output, and due in part to likelihood there will be some carryover tonnage still on mill books by close of this year. In some instances the production outlook has been further clouded by necessity of initiating a blast furnace relining program. Based on a recent thorough study of operating facilities and production outlook by a leading producer, it was found that monthly production quotas this year were set too high and

# When Performance is Measured in R.P.M.

. . . give the job to precision steel castings that conform accurately to specifications and blueprints.

This turbine runner—a Birdsboro Precision Steel Casting made by the Randupson Process—came out of the mold true-to-pattern, with a clean skin and smooth, sharp contours that cut frictional losses to the minimum. And its uniform-grained structure gave it a start on a long life of trouble free operation.

If precision in steel castings is what you are looking for, we'll be looking for a call from you. Put Birdsboro's experience and facilities to work on your problem.

BIRDSBORO STEEL CASTINGS

**BIRDSBORO STEEL FOUNDRY & MACHINE COMPANY • BIRDSBORO, PA.**

BUILDERS OF: Steel Castings • Steel Mill Equipment • Hydraulic Presses • Rolls • Special Machinery • Crushing Machinery

**BIRDSBORO**

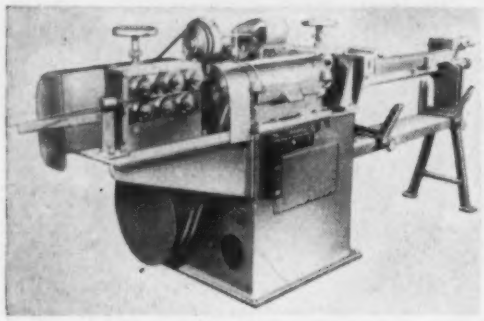
**PRECISION STEEL CASTINGS**

MADE BY RANDUPSON PROCESS

D1-47

# Speed AND UNIFORMITY WITH DORE WIRO-MATIC

## STRAIGHTENING AND CUT-OFF MACHINES AND ACCESSORIES



← MODEL "C"

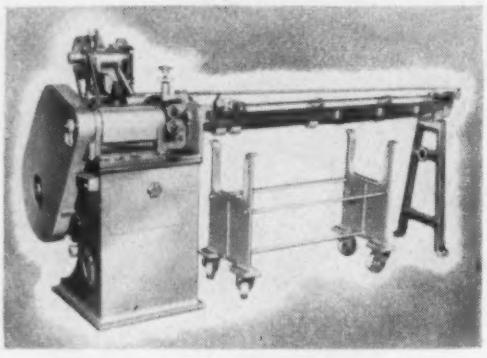
- CAPACITY— 5/16" DIA. WIRE
- 20 H.P. MOTOR
- PRE-STRAIGHTENING MECHANISM

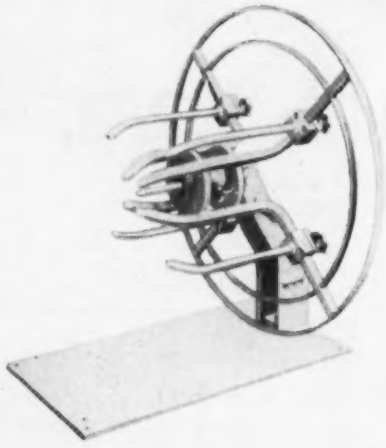
MODEL "A" →

- CAPACITY— .040 TO .156 DIA. WIRE
- 3 H.P. MOTOR

MODEL R-1 WIRE REEL

*"There's No Lifting"*





**SPECIFICATIONS**

WIRE STRAIGHTENING AND CUT-OFF MACHINES

- ★ Length of cut 3 inches to 20 feet.
- ★ Standard length—3 foot shuttle bar available up to 20 feet at extra cost.
- ★ Motor Driven Clutch.
- ★ Drive—All-Steel core Vee-Belt. Motor mounted on self-tightening adjustable brackets.
- ★ Standard equipment includes cast iron spinner dies, cut-off knife, bushings, etc., for any size of wire specified.

WIRE WAGONS →
BUILT TO FIT YOUR JOB

"DO MORE WITH DORE"

WIRE OR WRITE FOR COMPLETE CATALOG

MANUFACTURED ONLY BY
DORE MANUFACTURING COMPANY, INC.
GRAYLING, MICHIGAN


that a permanent downward adjustment to a more realistic level, which varies slightly between steel items, was in order for at least the first half of 1948. However, some upward revision in monthly production quotas is indicated toward latter part of next year, to reflect installation of additional primary steel and finishing facilities. Most producers hope to have practically all of their carryover tonnage cleared up by Feb. 1, barring unpredictable developments such as fuel shortage, mill breakdowns, etc. To accomplish this, however, a substantial reduction in mill allotments will be necessary on December and January shipments.

Alloy bar producers report a moderate upturn in new orders, notably from agricultural implement manufacturers.

## Plates . . .

Plate Prices, Page 127

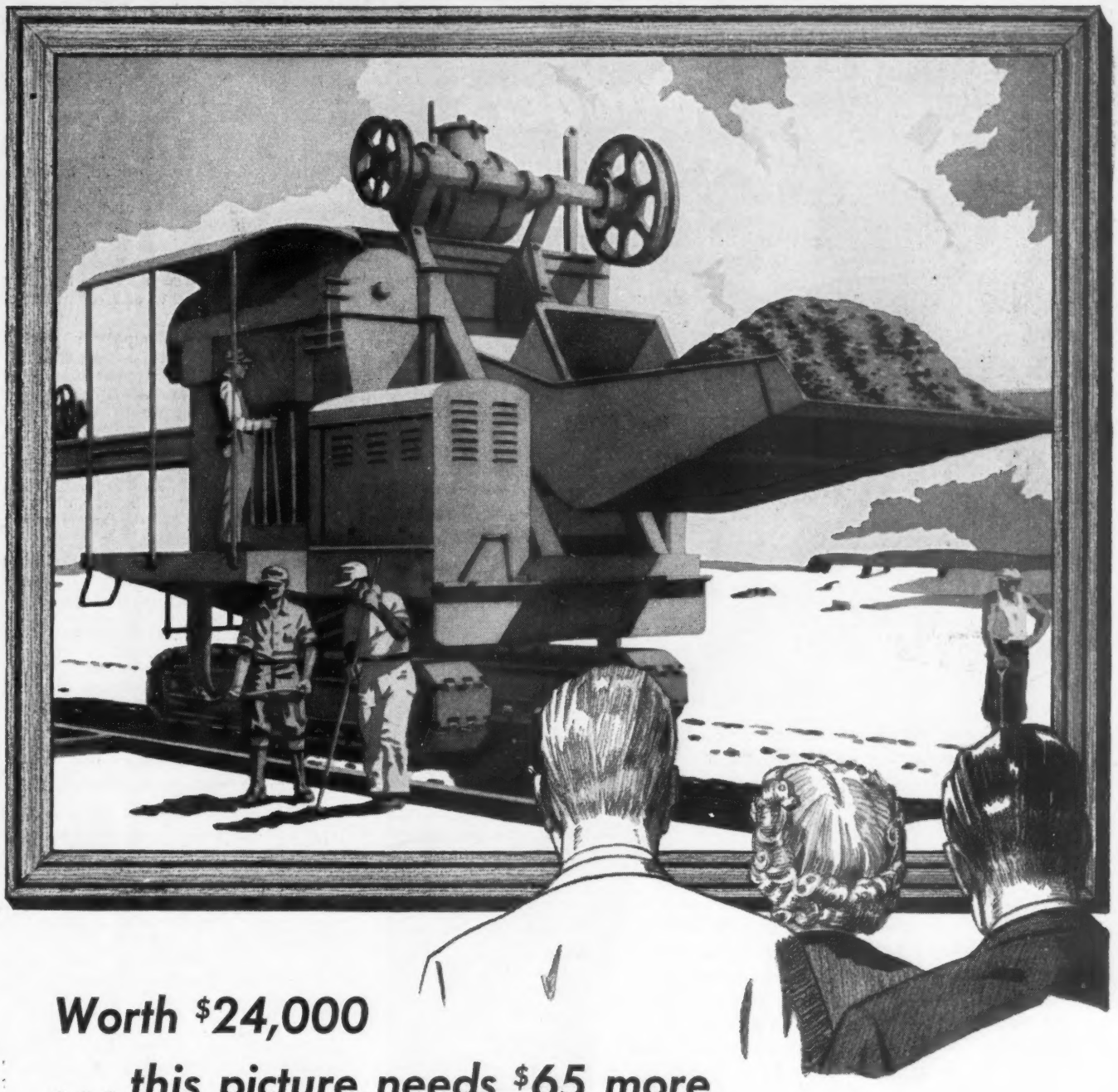
**Boston** — Considering the limited supply of light welding quality carbon plates, 1/2-inch and under, the number of small tanks being fabricated in district shops is surprising. Bulk of this tonnage is being supplied by a limited number of mills. Plate fabricators in all categories, with the possible exception of weldment shops, complain of lack of tonnage. Shipyards are not included and the slump in plate demand in that direction has been further enhanced by long strikes at some of the leading yards. The Navy is closing Nov. 3 on a substantial plate tonnage, 750 tons, hull plates, in one lot, east and west yards. Floor plate inquiry is active, also flanged work and heads with deliveries in most instances somewhat better than plates, large diameter spun heads excepted.

**New York** — While practically all plate producers will have a substantial amount of tonnage, originally scheduled for shipment this year, to handle early in 1948, most of them will be able to gage their carryover sufficiently to set up first quarter quotas in the next two to three weeks. Certain producers are already accepting more attractive tonnages offered for delivery in the first quarter, but they are still the exception to the rule.

**Philadelphia** — Central Iron & Steel Co., Harrisburg, Pa., subsidiary of Barium Steel Corp., advanced its price for steel plates $6 a ton last week, making the base price 4.45c per pound. The advance was attributed to increases in prices for scrap and other raw materials. Other plate mills continue at recent levels, although certain of the smaller independents indicate they may make some price adjustments soon.

**Birmingham**—Pressure for plates shows practically no let-up, even though not a great volume of new tonnage is being placed. Mills will have a substantial carryover into 1948 and, if car-building, ship repairs and construction and assorted needs for plate continues at the present volume, no appreciable additional tonnage is going to be available.

**Seattle** — Plate fabricators are handicapped by scarcity of materials, some substitutions being necessary. No large projects are pending but shops are reasonably busy with routine boiler and tank jobs.



# Worth $24,000
# . . . this picture needs $65 more

You may not use this sort of equipment, but it affords another shining example of where false economy might be extremely costly.

This efficient, fast, labor-saving road-paver cost well over $24,000—but it couldn't pave a square foot without wire rope. *That's* what is missing in the picture. How much does the missing wire rope cost? Well—ordinary, non-preformed wire rope costs about $52. The best of all wire ropes—Preformed Improved Plow Steel costs about $65.

Be safe. Be sure. If you use wire rope, use the best. Specify Preformed Improved Plow Steel for your next rope. And when you buy a machine—any machine—make certain it is equipped with Preformed. You will like it because it lasts longer. Your workmen will like it because it is easier and safer to handle.

*WRITE FOR FREE COPY of helpful book about Preformed.*
*Address: Preformed Wire Rope Information Bureau,*
*520 North Michigan Avenue, Chicago 11.*

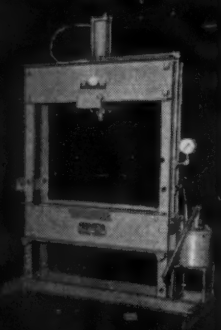
ASK YOUR OWN WIRE ROPE MANUFACTURER OR DISTRIBUTOR

**WIRE ROPE HANDLES EASIER - LASTS LONGER**

# Rodgers
## SHOP PRESSES

★ Flexible in Performance
★ Versatile in Use
★ Rugged—Durable in Construction

Illustrated (left) is the Rodgers 150 ton Stationary Shop Press with extra height, equipped with 2-way Travel Cylinder and "D" Pump with 4-way Valve Arrangement.



The Rodgers "Sixty"—60 ton Shop Press (shown above) takes care of those miscellaneous jobs that waste so much time and labor. Available with hand operated pumps, or with gear head motor drive, also powered with "D" pump power unit.

Rodgers 100-ton Stationary Shop Press powered with 4-Speed Hand Operated Hydraulic Pump, also available with "D" pump power unit. Please note that on all presses the cylinder is movable across the entire width of press.

For tough service and maintenance work in pressing, squeezing and forcing, there is a Rodgers Press to meet your requirements. These rugged, flexible shop presses are available in 60, 100, 150 and 200 ton sizes. (300 and 400 ton capacity presses are available upon special order). They all embody the same proved Rodgers design and performance features: Bolster of press is raised and lowered by a hand crank . . . special alloy steel pins can be adjusted to allow desired opening . . . cylinders may be had with one way travel or two way travel in ram travel lengths from 6" to 14" as desired—frame construction is of strong, durable rolled steel plate. Power is supplied by self-lubricating hand pumps or power driven pumps.

Save time and labor on your jobs with a Rodgers Shop Press—the exact model that is best suited for your needs. You'll get prompt delivery on any standard model press.

✻ *Send for this catalog giving complete descriptions, illustrations and specifications of Rodgers Shop Presses. There's no obligation. Write today for your copy.*

**Rodgers Hydraulic, Inc.**

HYDRAULIC POWER EQUIPMENT

Shop Presses · Counter-Frame Presses · Power Pump Units · Portable Presses

7423 Walker St., St. Louis Park, Minneapolis 16, Minn.


## Wire . . .

Wire Prices, Page 127

**Boston**—Demand is heavier here and pressure has increased for manufacturers' wire and most specialties. Producers' backlogs are heavier with first quarter schedules filling. Rod supply is slightly improved, but this is chiefly in high-carbon grades. Screw manufacturers and producers of small fasteners lack inventory balance in wire. Demand for cold heading wire continues active. Music wire deliveries are ahead of many grades, five to six weeks on medium sizes.

**New York**—Nail supply situation here is baffling. Production will approximate 800,000 tons this year compared with an all-time record high of 845,000 tons in 1942. Yet there are acute shortages in the east and an active "gray" market. This points to maldistribution rather than an overall shortage. Some doubt exists as to whether all tonnages offered in the "gray" market are actually available for shipment.

**Birmingham** — Long-delayed fall weather continued to accelerate demand for farm wire of all types with the result that jobbers are doling out their scant allocations in the most equitable manner possible. Drawn wire is not nearly sufficient to take care of needs. Agriculture demand remains strong for all specifications.

## Tubular Goods . . .

Tubular Goods Prices, Page 127

**Pittsburgh** — Output of standard pipe and oil country goods has held generally unchanged in recent weeks at approximately record peacetime production pace. However, the demand-supply relationship in these items with few exceptions shows no improvement and there is little prospect of this occurring for months to come. Tight supply situation in drill pipe has eased somewhat recently, and same is true to a greater extent in alloy, stainless and electric welded mechanical tubing. In fact, in some instances these latter items are readily available from stock. National Tube Co.'s expansion program, said to involve close to 300,000 tons of tubular products, is expected to be an important factor in alleviating the critical shortage of pipe in the months ahead. However, some of these additional facilities will not be in operation until 1949.

Cast iron pipe producers have not been able to make much headway against order backlogs, with deliveries extended 15 to 18 months in smaller size classifications.

**Seattle**—With the release from a labor tieup in California of intercoastal ships, considerable steel is being delivered to this area after a long delay. This includes sizable tonnages of cast iron pipe sorely needed in pending construction jobs. The pipe market is slow here, due to seasonal conditions. Agencies expect little new business until late in the year when bids will be out for spring jobs. The potential demand for pipe in the Pacific Northwest is of major proportions. Meanwhile, steel pipe has made inroads because of the better deliveries obtainable.

# A HABIT TO JOE...

## "NEW IDEA" TO HIS NEPHEW

## ...YET BOTH WANT THE SECURITY your P.S. Plan Provides

HAVE YOU told all your new or recently hired employees about the benefits of the Payroll Savings Plan for the regular purchase of U. S. Savings Bonds? Wage earners, according to a recent nation-wide survey, want security more than anything else. They prefer security to big pay, soft jobs, authority, "success."

There is no surer way to this peace of mind than systematic savings. And what surer, safer, better means can your employees find than payroll allotments for U. S. Savings Bonds? Bonds that return $4 at maturity for every $3 they invest!

Your active support of the Payroll Savings Plan is an investment in employee contentment, in the citizenship of your community, and in the security of America's future. This is practical "employee relations" of the highest type and pays dividends of satisfaction to everyone.

Start a drive today for larger participation in the plan. Many employees may be unfamiliar with its advantages. If you want literature for distribution, contact your State Director of the Treasury Department's Savings Bonds Division.

### *New Savings Bonds Plan won't affect the P.S.P.*

THE Treasury Department and the banks of America are making it possible for farmers, doctors, and other self-employed people to participate in "automatic" Bond buying by special arrangement with their banks. This extension of the Savings Bonds program is not a partial payment plan and is intended *only* for people who are not in a position to take advantage of the Payroll Savings Plan.

*The Treasury Department acknowledges with appreciation the publication of this message by*

**STEEL**

*This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and The Advertising Council.*

HALLDEN

AUTOMATIC SHEARS

known by these

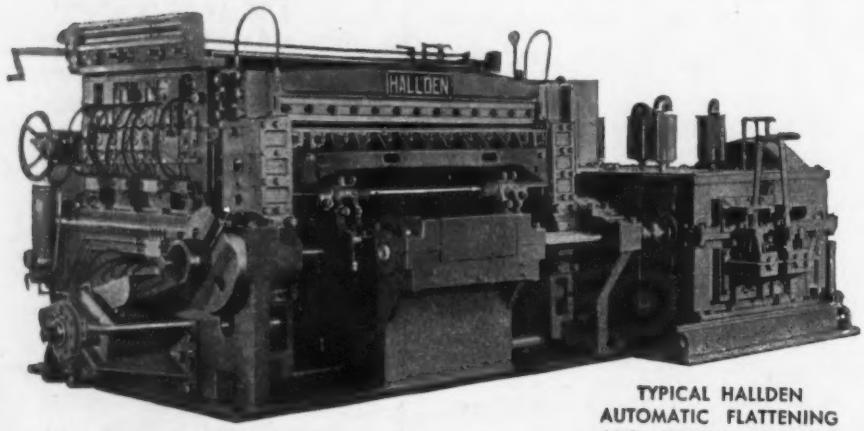
HALLDEN HALLMARKS . . .

**CUTTING ACCURACY** up to 1/64" plus or minus obtainable with the Hallden Automatic Shear. After cutting, metal is conveyed or stacked depending upon the customer's requirements.

**CONTINUOUS FEED** of metal through the machine is obtained by synchronizing the flattener with the flying shear, eliminating "stop and start" cutting.

**FLEXIBILITY OF DESIGN** allows quick change of shear knives and ease in removal of flattening rolls for grinding. Shear knives have four cutting edges and always move in a mutual plane.

**RUGGEDNESS OF CONSTRUCTION** permits continued hard use with little attention other than lubrication. Flattening rolls are individually driven to keep maintenance to a minimum.




TYPICAL HALLDEN AUTOMATIC FLATTENING AND CUTTING MACHINE

THE HALLDEN MACHINE COMPANY

THOMASTON, CONNECTICUT

SALES REPRESENTATIVES

THE WEAN ENGINEERING COMPANY, INC., WARREN, O.

W. H. A. ROBERTSON & CO., LTD., BEDFORD, ENGLAND

## Tin Plate . . .

Tin Plate Prices, Page 127

**Pittsburgh** — Tin plate output next year should record moderate improvement on basis of indicated pig tin and steel supply, although no significant increase in output is held likely until after first quarter at the earliest. Despite high level of present production schedules, it is not considered probable that fourth-quarter quotas and carryover tonnage can be shipped by close of this year; this is particularly the case of one interest faced with a necessary blast furnace relining program scheduled to get under way late next month. Recent 10 per cent rail freight rate advance has forced tin plate producers in Pittsburgh, Wheeling and Weirton areas to meet increased freight absorptions in equalizing with competition at some key consuming points. With the first-quarter export tin plate quotas unchanged, it appears that little revision in distribution pattern will develop for that period except for the trend toward increased use of electrolytic in relation to hot-dip. Higher contract tin plate prices for 1948 seem inevitable, but will not be announced until late this year, at which time a more accurate estimate of production costs will be possible.

## Reinforcing Bars . . .

Reinforcing Bar Prices, Page 126

**New York** — Reinforcing bar supply continues critical, especially on the smaller sizes, 3/4-in. and under. Latest sizable inquiry involves 2650 tons for the Gowanus housing project of the State Housing Authority, with bids due Oct. 30. Approximately 4000 tons for the Lillian Wald housing project has been distributed recently by Knickerbocker Concrete Arch Construction Co. Inc.

**Pittsburgh**—Producers' order backlogs remain extended 6 to 8 months despite relatively good production in recent weeks. New inquiries are well sustained in spite of extended mill deliveries and uncertain price trend, primarily for bridge, highway work and housing construction.

Sellers state deliveries on sheet piling are extended at least six months, with supply tightest of any previous period on record.

**Cleveland** — Although demand for reinforcing bars has been strong, an even greater pressure for deliveries has been apparent recently. Also in strong demand is mesh. Because supply of reinforcing bars is inadequate, one warehouse is accepting random lengths of bars when available in order to preserve its 60-ft bars for jobs requiring the longer lengths. Tightness in the reinforcing bar situation is said to be not entirely the result of construction demands, for construction has been held back by high costs. Rather, the tight situation is attributed to a decline in tonnage of rerolling rails available, with a result the current reinforcing bar supply is dependent to an increased degree on new billets.

**Seattle** — Capacity operations are being maintained by rolling mills in this area. Their first objective is to reduce current order backlogs and expedite delivery. So much work is

on the books that some sizable jobs cannot be figured, contractors finding difficulty in obtaining supplies in some instances. Mills are booked to the end of the year and, because of their oversold position, they are not accepting first quarter contracts. Much new work, involving reinforcing bars, is pending in this area.

## Structural Shapes . . .

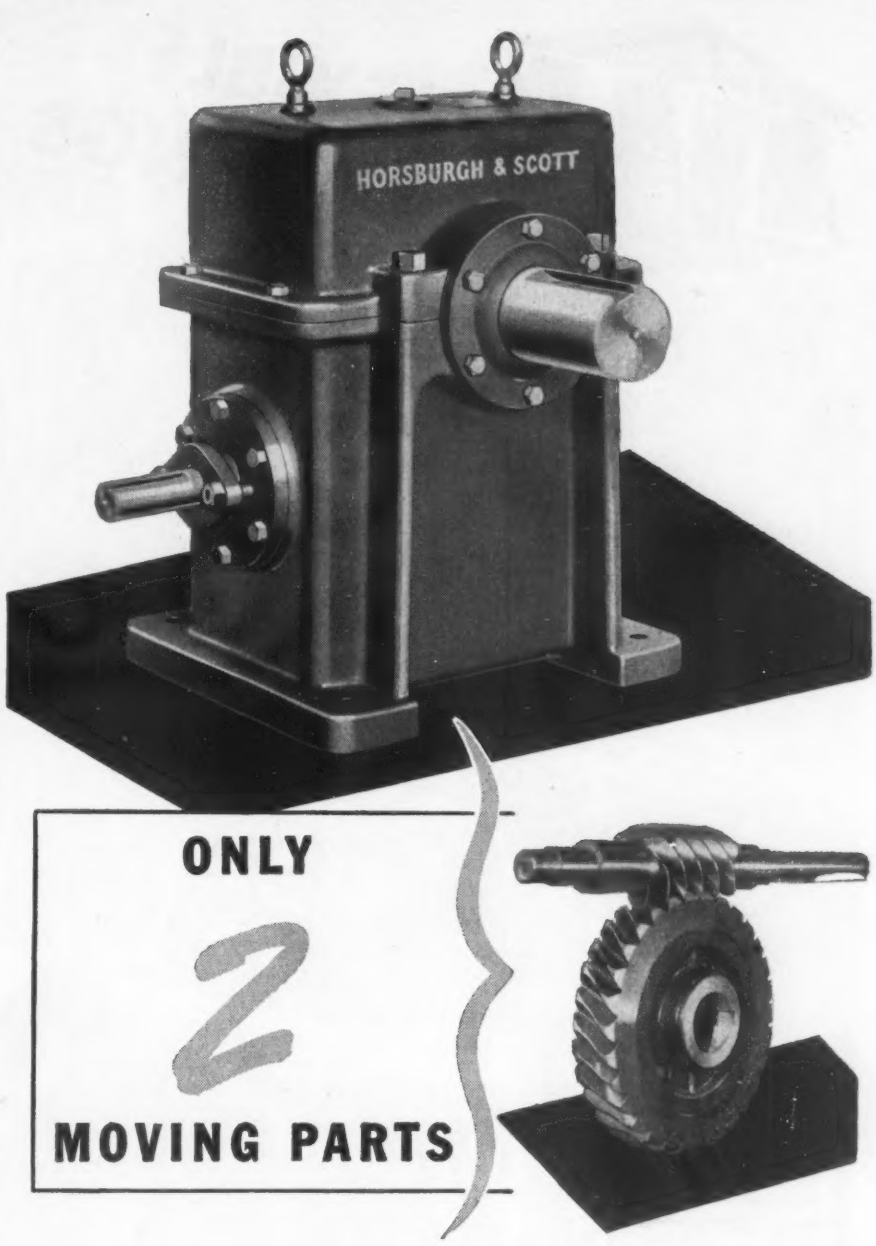
Structural Shape Prices, Page 127

**Boston** — New contracts and inquiry for small and medium fabricated structural tonnages are lower, but district shops are not making inroads on backlogs that might be expected due to lack of plain material, notably in small sizes. While a few distributors note a slight improvement in volume of bar shapes received, structurals reaching warehouses are frequently moved against orders without being placed in stock. In some cases, small fabricators are over-committed based on current allocations with slight chance of an increase in the latter over the balance of this year. Bulk of the steel contracts for a telephone building in this area have been placed and are in shops, but a substantial tonnage for power plant expansion remains to be placed. Public Service Co. of New Hampshire will build a 40,000 kilowatt generating plant at Portsmouth to cost $5 million.

**Cleveland** — Difficulty of procuring sufficient steel is resulting in ingenious but costly solutions of problems in structural fabricating shops. Unable to obtain I-beams, one fabricator is making them by splitting a 12-inch zee lengthwise and welding the two sections onto another 12-inch zee. This not only adds to the cost but delays delivery. In an effort to get sufficient steel for his plant, this fabricator is augmenting mill shipments by purchase elsewhere at full warehouse prices or better. Even so, this fabricator's operating rate is only two-thirds of that possible under normal steel supply conditions and only one-half enough to meet present demand. Shortage of plates, 3/16-inch to 3/4-inch, also handicaps this fabricator's output of water tanks and other products.

**Birmingham**—Some new inquiries are reported for structural shapes for various building projects, but actual tonnage placed is not particularly impressive. One office building project, definitely in the mill earlier in the year, now depends upon the result of a survey to determine if rentals necessary under the present building costs are too high for prospective tenants.

**Seattle** — Bethlehem Pacific Coast Steel Co., San Francisco, submitted the low bid of $8,263,904 for construction of the Narrows Bridge, near Tacoma, Wash., involving 14,241 tons of shapes. John A. Roebling's Sons Co. of California was low for wire cable at $2,932,681, involving 5216 tons. This combined bid of $11,196,585 is 31 per cent higher than original cost estimates of the Washington Toll Bridge Authority engineers and compares with tenders of Columbia Steel Co. of $8,937,357 and $4,661,503, respectively, or a total of $13,598,860. It is expected the contract will be placed within a short time. Specifications require completion 850 days after construction begins.




● Horsburgh & Scott Worm Gear Speed Reducers are extremely simple in design, compact, efficient and strong . . . assuring quiet operation, low maintenance and long life. They are available in 8 types . . . reductions from 3 5/8 to 1 up to 10,000 to 1.

*Send note on Company Letterhead for Speed Reducer Catalog 46*

**THE HORSBURGH & SCOTT CO.**

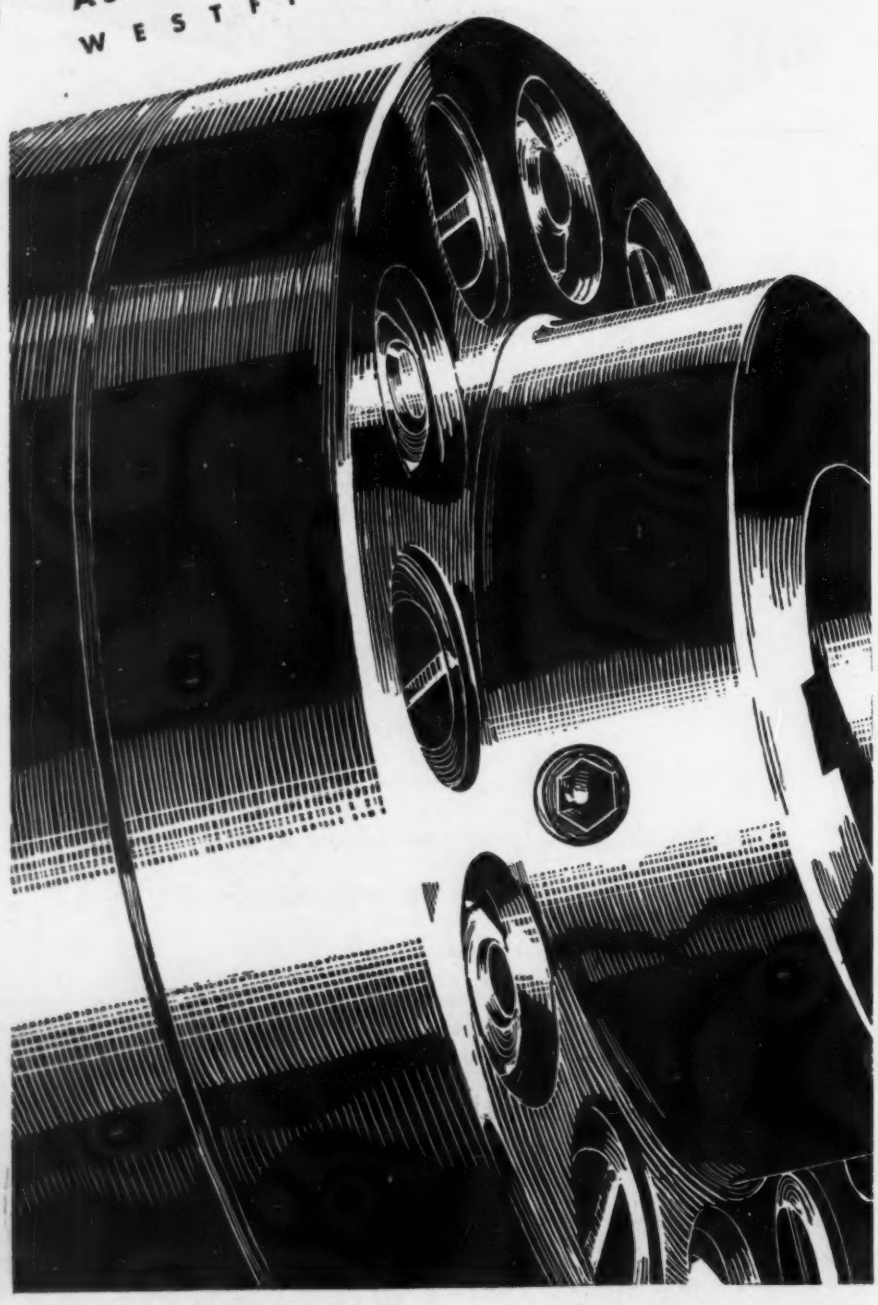
GEARS AND SPEED REDUCERS

5112 HAMILTON AVENUE • CLEVELAND 14, OHIO, U. S. A.

AJAX FLEXIBLE COUPLINGS

The fact that *all the horsepower* goes *through the coupling* emphasizes the *importance* of protecting direct-connected machines against misalignment. Write for the Ajax Coupling data book or phone the Ajax man in your territory.

AJAX FLEXIBLE COUPLING CO. INC.
WESTFIELD, NEW YORK



## Pig Iron . . .

*Low phosphorus charcoal pig iron price advances $6 to $50, Lyles, Tenn.*

Pig Iron Prices, Page 128

**Pittsburgh** — Foundry operations continue restricted by limited pig iron supply, for which there is little hope of improvement in the months ahead. Some foundries have been forced to shut down for short intervals due to the iron shortage. However, despite well below capacity production schedules, an increasing number of gray iron interests are making some inroads against order backlogs due to a falling off in volume of incoming orders. In applying the recent 10 per cent freight rate advance the merchant furnace interest here is carrying out its delivered price quotations to three decimal places on a per ton basis. This practice is also being folmanufacturers and other interests.

Tennessee Products Corp., Nashville, Tenn., advanced the price Oct. 21 on semi-cold blast, low phosphorus charcoal pig iron $6 per gross ton to $50 f.o.b. furnace at Lyles, Tenn. The previous advance on charcoal iron was $1 a ton to $44 on July 1 last, and current price level compared with $33 under OPA. Distribution of this iron continues under strict allocation with output falling substantially below stated requirements of steel roll manufacturing and other interests.

**New York** — While pig iron appears increasingly scarce, some gray iron foundries report an easing in demand on them for castings. Some foundries, in fact, are now actively promoting business where they can. However, casting makers generally still have fairly good backlogs.

**Philadelphia** — Shortage of pig iron continues pronounced, with steel mills having difficulty sustaining present production and with foundries melting at a lesser rate than a month ago.

**Buffalo** — Foundries continue to operate under difficulties, due to scarcities of pig iron, coke and labor. Some of the largest melters are resorting to display advertisements to build up their working forces, but with only moderate success so far. Pig iron probably will be short as long as open hearth operations hold at the current high levels. The coke pinch not only complicates foundry operations but also is the reason for one merchant blast furnace being banked

**Cincinnati** — Foundry stocks of pig iron are so low there is the persistent threat of shutdowns in case deliveries are delayed. Melters, therefore, to sustain production, are unable to cut proportions of scrap. The district needs for iron are undiminished although the castings backlogs for some types of products are lighter than earlier in the year. The boom in home building is reflected in steady, heavy requirements for heating equipment.

**Birmingham**—Pig iron users in this territory continue their clamor for material. Some of the larger and regular users, while generally better supplied than those without regular sources, say the situation is getting tighter rather than easier.

## Warehouse...

Warehouse Prices, Page 129

**Boston** — Most steel products moved from warehouses here are 6 cents per 100 pounds higher as a result of the increase in freight rates. An exception is cold-rolled strip which is 2 cents higher. Fourth quarter allocations have been reduced on sheets, structurals and, in some instances, plates. While there is a range of mill prices for carbon steel plates, bulk of tonnage moving from warehouse is priced at 5.11c with floor plates 6.79c.

**New York** — Brokers again raised their buying prices here last week to $38, fob shipping point, for steelmaking grades and to $36 for No. 3 bundles. This represents an increase of $4 a ton within a week. Both brokers and consumers are moving cautiously. In fact, some of the Pittsburgh mills withdrew from the market completely. Brokers also have advanced their buying prices on other grades in varying degrees.

**New York**—Warehouse stocks of carbon steel products are in short supply while those of specialties are sufficient in most instances to meet demand. Cold-finished bar inventories now balance demand in the smaller sizes. Hot-rolled bar and mechanical tubing stocks have improved. Reduced allocations limits sales of flat-rolled and structural items.

**Philadelphia** — Warehouse steel demand continues brisk, with one leading distributor expecting business this month to be the heaviest so far this year. Mill receipts, however, fix the limit on some lines, particularly in sheets, plates and small bars and angles. District jobbers generally have adjusted prices to compensate for the recent freight rate advance.

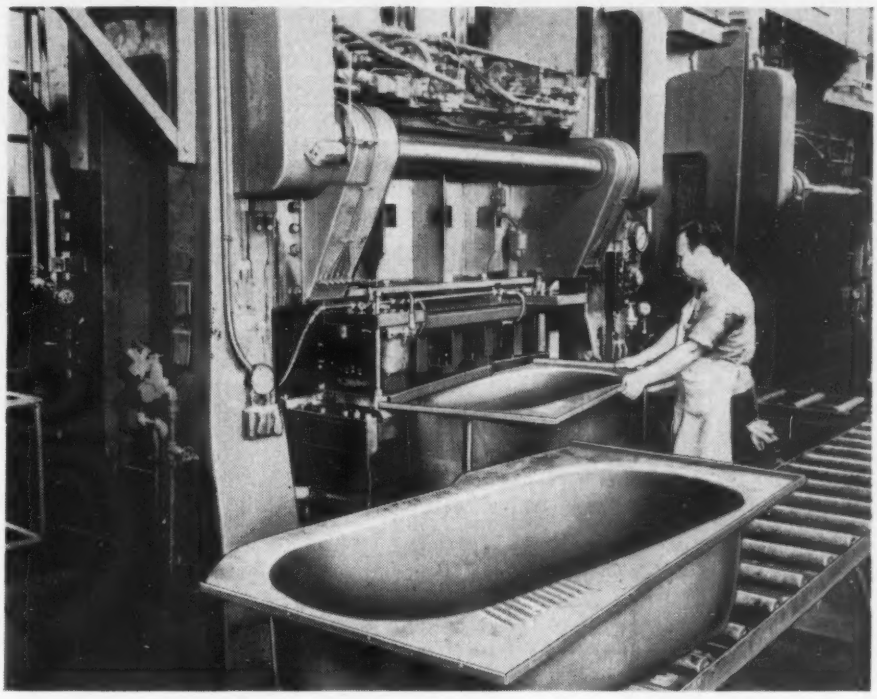
**Pittsburgh** — Steel distributors here do not intend to revise prices to reflect the 10 per cent increase in rail switching charges on mill steel deliveries for warehouse stock. Most distributors continue to fall far short of meeting urgent steel requirements of customers, notably for shapes, plates, standard pipe, nails and sheets and strip. Cold-finished carbon bars, stainless items, and alloy bars and tubing are in ample supply. Warehouse interests have been notified of substantial reductions in product allotments this quarter, although actual mill receipts in some instances may register some improvement over previous period with mills concentrating on clearing up large carryover tonnages.

**Cleveland** — Confronted with demand far in excess of supply, warehouses continue to find it impossible to make any headway in balancing stocks of carbon steel products. However, some report a fairly good balance in alloy products. In an effort to fulfill demand from consumers, one warehouse reported it is accepting mill shipments of miscellaneous carbon steel sheets, which under ordinary conditions could be disposed of only with difficulty.

**Chicago** — Shortage of stocks at warehouses is aggravating the steel supply situation and this, coupled with the fact that mill quotas to consumers have been cut sharply, suggests that the balance of the year will find steel in the most critical spot since end of the war.


*There's a*

**WILLIAMS-WHITE PRESS TO FIT *Your* REQUIREMENTS**



This 100 ton Hydraulic Press made by WILLIAMS-WHITE & CO. shapes rolled edges on steel bathtubs in the Norris Stamping and Manufacturing Co. plant, Los Angeles, Calif.

WILLIAMS-WHITE Hydraulic Presses are designed and built to meet your particular need. Whatever your production problem may be, our staff of engineers and designers, backed by the experience of nearly 100 years of building the basic tools of industry, are always at your service.

WILLIAMS-WHITE Presses, Hammers, Punches, Shears and Rolls are famous all over the World for precision and efficiency. Write us, giving as much detail as possible about the particular tools you need and we will send detailed specifications.

MAKERS OF PRECISION PRODUCTION TOOLS FOR NEARLY 100 YEARS

**WILLIAMS-WHITE & Co.**

MOLINE, ILLINOIS

## Industry, Government Open Drive To Bring Out Scrap

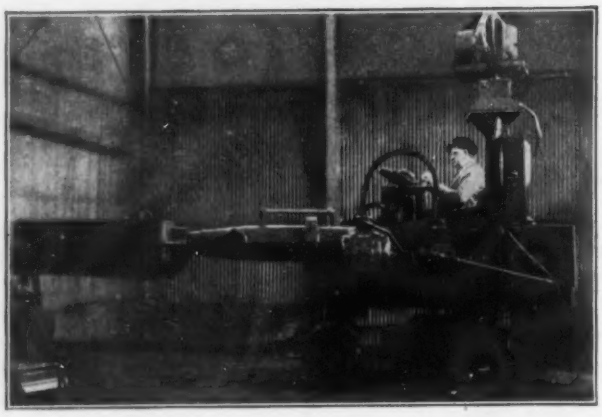
**Cleveland**—A joint industry-government drive to unlock stores of desperately needed iron and steel scrap was launched in Cleveland last week at a meeting of the Steel, Foundry & Scrap Industries' Committee for Expediting Iron & Steel Scrap.

Robert W. Wolcott, chairman, told representatives of the Army, Navy, War Assets Administration, executive office of the President and executives from scrap-using industries that quick action is needed to obtain more scrap to avert a crisis when winter interferes with collections and shipments.

Representatives of governmental agencies spoke at the meeting and pledged fullest possible co-operation. The representatives included: R. C. Turner of the executive office of President Truman; John Ten Eyck, War Assets Administration; Comdr. F. J. Roberts, office of the undersecretary, Department of the Navy; and Lt. Col. S. M. Pool Jr., Department of the Army.

Mr. Turner asserted that "as long as scrap is so urgently needed in this country there will be no relaxation of the government's co-ordinated scrap program." Plans are being made to draw heavily on war-generated scrap.


BROSIUS AUTO CHARGERS ARE *Engineered* FOR Production



IN CAPACITIES OF FROM 2,000 TO 20,000 POUNDS

Brosius Auto Chargers are engineered to meet the needs of any size plant. Machines are designed to handle charging boxes for serving melting furnaces, or are equipped with tongs to handle Billets, Slabs, Ingots, etc., serving heating furnaces, mills, hammers, presses, etc.

They receive their power from the plant supply through a rotating collector, or can be self-powered through a gasoline engine driven generator mounted on the machine. They require no tracks or expensive runways.

**Write for Your Copy of Our NEW General Catalog**

**Edgar E. BROSIUS Company Inc.**

**Designers & Manufacturers of Special Equipment for Blast Furnaces & Steel Mills**

**SHARPSBURG, Pittsburgh (15) PENNSYLVANIA**


## Scrap . . .

*End of present upswing in prices is not in sight as supplies remain tight*

Scrap Prices, Page 132

**Boston**—Latest upturn in steel scrap prices reflects in effect a partial return to price differentials between the two grades of heavy melting steel; strictly No. 1 is commanding $2.00 to $2.50 more than No. 2 and there is a similar spread between the two top bundle grades. There appears to be some brokers' buying in the upsurge in steelmaking scrap. There is a genuine shortage of good scrap.

**Philadelphia** — District consumers of steelmaking scrap grades have bought substantial tonnages at $42, with the market undertone still strong. Some scrap dealers already are having to pay almost as much for material to apply against these new contracts as they sold it for and, therefore, are no longer interested in booking further tonnage at the new levels. Late last week, heavy melting grades, No. 1 busheling, and Nos. 1 and 2 bundles were quoted nominally at $42; No. 3 bundles, $40.

Cast iron grades advanced appreciably, with No. 1 cupola cast at $48 to $49; No. 1 machinery cast, $50 to $52; charging box cast and heavy breakable cast, $48 to $49. Unstripped motor blocks were quoted $45 to $46; clean auto cast, $50 to $51; No. 1 wheels, $49 to $50.

**Pittsburgh** — At least one large steel interest here last week was forced to place orders for heavy melting steel at $43 per ton, an increase of $5 over previous nominal price for local material, to meet the higher price levels in other areas.

Several steel producers here and elsewhere withdrew from the scrap market late last week in an effort to halt the "hectic" rise in steel scrap prices.

The unfortunate feature about upturn in scrap prices is that very little, if any, additional material will be made available to the mills. It is pointed out that scrap prices again have lost their historical relationship with that of pig iron. It is also contended that since present quotations are over 100 per cent above prewar levels the current prices certainly are not justified from standpoint of increased collection and segregation costs that have occurred in the interim. One interesting aspect of the present market is that considerable $38 orders are still outstanding and mills are insisting on completion of shipments on these orders at that price level. However, this policy is by no means general, as indicated from reports in other districts.

**Chicago** — Scrap market was in a state of turmoil last week. Following several weeks during which mills clung tenaciously to a policy of paying no more than $39, delivered, for heavy melting steel, a few mills for a short interval paid $43, an advance of $4 a ton. Almost immediately, however, the mills involved declined to purchase further at this figure and returned to their former offering price of $39. Until the market becomes

resolved, it is unlikely that sellers will be willing to accept business of any sizable proportions. It would appear that consumers are acting to prevent a runaway market, a situation which could develop because of the short supply and heavy requirements for melting material.

**Cleveland**—Pressure for steelmaking grades of scrap eased late last week after large steel companies again halted buying because they could see no end to the price surge generated by their entrance into the markets. Before the withdrawal, No. 1 heavy melting steel originating in Cleveland went to consumers here for $40.75-$41.25, while remote scrap brought $42.50-$43, delivered here. These prices represented jumps of $2.75. Withdrawal was expected to take immediate pressure off the prices, but it was anticipated that several small mills which all along have been paying high prices for scrap will continue to do so. Prices zoomed early last week when large steel companies, which for some time had refrained from purchasing scrap in an effort to "hold the line" on prices, made efforts to strengthen inventories in preparation for winter.

**Buffalo** — While scrap prices are unchanged, dealers refuse to accept additional orders from mills at prevailing ranges. Prices on steelmaking grades are quoted nominally $1 to $2 above ranges at which last sales were reported. New business in steelmaking grades is expected shortly.

Stronger tendencies are prevalent throughout the list. Gains up to $2 a ton were reported on cast scrap.

**Detroit**—Entire scrap list has advanced $3 a ton, following the apparent collapse of efforts by steel mill buyers to hold the old price. Both Ford and Great Lakes have advanced their buying prices by this amount. As always on a rising market, dealers are disinclined to sell and are talking prices $10 a ton higher, or the equivalent of $45 on steel grades at Detroit. Increases apply equally to cast material, currently particularly strong, and to low-phos punchings and plate. Mill inventories of scrap are woefully inadequate. In an address here last week, E. T. Weir, chairman of National Steel Corp., said present scrap on hand is estimated to be sufficient for only five weeks' operations.

**Cincinnati**—The scrap market here has reacted to higher prices in the East. The upward readjustment was necessary to retain normal tonnages for consumers of this district, even though major melters had built up fair reserves and were foregoing any aggressive buying policies which might send prices higher. Despite a steady flow of scrap and a fair volume of melter's stocks, brokers and dealers foresee a continued strong market on theory that an actual shortage of material will prevail during the winter.

**Seattle**—Demand for steel scrap continues heavy due to the capacity operations of mills. Receipts are about equal to consumption and inventories are lagging. Increased production is coming from ship breaking plants which are showing greater speed and efficiency. Due to the influence of higher prices in the eastern market, there is an unconfirmed rumor that the $22 base here will be raised shortly.

## Iron Ore . . .

Iron Ore Prices, Page 128

**Cleveland** — Consumption of Lake Superior iron ore increased slightly on a daily basis during September compared with the preceding month, although total consumption declined due to the shorter month. Total consumption in September amounted to 6,491,937 tons compared with 6,637,835 tons in August and 6,380,155 tons in September, 1946, according to the Lake Superior Iron Ore Association. This brought total consumption for the first nine months to 59,516,825 tons with furnaces in the United States accounting for 57,378,844 tons, compared with 43,820,885 tons in the like 1946 period when United States furnaces accounted for 42,517,756 tons.

Total stocks as of Oct. 1 aggregated 38,369,549 tons, representing a net gain of 4,473,087 tons in September. This compared with 37,542,950 tons as of Oct. 1, 1946. Of the Oct. 1 total, furnace stocks accounted for 32,656,769 tons in the United States and 1,407,915 tons in Canada while stocks on United States Lake Erie docks accounted for 4,304,865 tons.

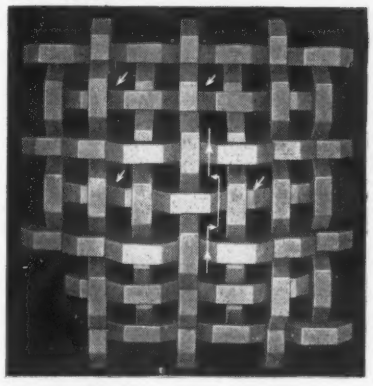
A net gain of four was recorded in the number of furnaces in blast in the United States as of Oct. 1, making 172 in blast and 11 idle while


# Here is the ANSWER to CHECKER BRICK spiraling and twisting —

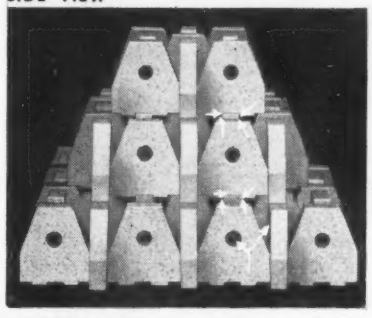
## SEAVER 4-WAY LOCKED CROSS-VENT

CHECKER BRICK - *the improved* BASKET-WEAVE

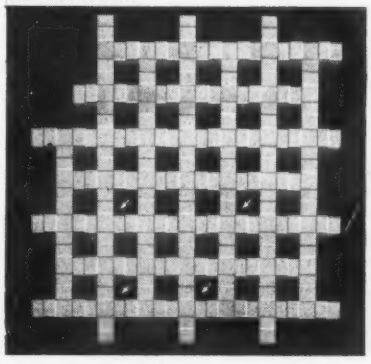
TOP VIEW



SIDE VIEW



BOTTOM VIEW



**TOP VIEW** Arrows show continuous flues:—square, open flues from top to bottom. May be used with or without tubular inserts. Cross-vents (indicated by line) give equalized heat and air over complete checker area, turbulence and high heat exchange.

**SIDE VIEW** Arrows show 4-Way lock: top and bottom—sideways in each direction. Lock is part of brick—expands and contracts with brick—cannot unlock, twist or spiral. Connected arrows show cross-vents.

**BOTTOM VIEW** Here again arrows show continuous flue with square open flue from top to bottom.

Seaver 4-Way Locked Cross-Vent Checker Brick increases heating surface 30% over present installations in stoves with plain basket weave—90% of volume exposed. *Can be used for replacement of top checkers.* Cost comparable to ordinary basket weave.

*WRITE TODAY for blueprints and further information. Try these improved Checker Brick on your top layers and check your results.*

**JAY J. SEAVER, Engineers**

100 North La Salle Street • Chicago 2, Illinois

Canadian operations held unchanged at 9 furnaces in blast and only 1 idle. Although total furnaces held unchanged at 193, Carnegie-Illinois Steel Corp.'s No. 8 furnace at Braddock, Pa., has been dismantled and Inland Steel Co. is now operating the No. 2 DPC furnace at Indiana Harbor, Ind.

Shipments of Lake Superior iron ore during the week ended Oct. 20 declined to 2,217,732 tons from 2,277,950 tons for the preceding week but showed an increase over the 2,058,643 tons for the like 1946 week. Total shipments for the season to Oct. 20 amounted to 67,935,349 tons compared with only 48,981,995 tons for the like 1946 period. Shipments during the week ended Oct. 20 from United States ports amounted to 2,146,380 tons, or an average daily loading of 306,626 tons, compared with 2,025,129 tons, or a daily average of 289,304 tons in the like week a year ago. Shipments from United States ports so far this season total 66,476,241 tons, an increase of 18,553,517 tons over the like 1946 period.

## Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 127

**New York** — Bolt and nut backlogs continue well extended, with demand particularly pressing for the small assembly fasteners of one description or another. Much inquiry is pending for export as well as domestic shipment, although there has been an appreciable falling off in demand from South America, due to the dollar stringency.

## Rails, Cars . . .

Track Material Prices, Page 127

**New York** — Car buying is featured by the placing of two sizable lists, one involving 3160 freight cars for the Atlantic Coast Line and the other 3000 for the New York Central and its subsidiary, the Pittsburgh and Lake Erie. Locomotive buying includes six diesel-electrics for the Chicago Eastern Illinois and three for the Southern Pacific.

**Baltimore**—Baltimore & Ohio Railroad sent out inquiries last week for an additional 2000 seventy-ton hopper cars. These will supplement orders already outstanding for 7500 freight cars not yet completed.

## Canada . . .

**Toronto, Ont.** — Canada's foreign trade for the month of August had a total value of $429,400,000 which was 8 per cent below the $466,400,000 for July, but 5 per cent above the $409,200,000 for August, 1946, according to the Dominion Bureau of Statistics.

For the first eight months of this year, external trade had a total value of $3,497,800,000, or an increase of 28.7 per cent over the $2,715,900,000 reported for the corresponding period last year.

Aggregate value of exports for the first eight months this year amounted to $1,786,300,000, a gain of 16.4 per cent over the $1,494,200,000 the same period of 1946.

For the eight months ended August, 1947, imports had a total value of $1,688,100,000, an increase of 40 per cent over the $1,204,700,000 in the corresponding eight months of 1946.

## Metals Show in Chicago Emphasizes Productivity

(*Continued from Page* 46)

Focke, research metallurgist, Diamond Chain & Mfg. Co., Indianapolis; E. G. Mahin, head of metallurgy department, University of Notre Dame, South Bend, Ind.

**Hook Gets Medal**—At the ASM banquet Charles R. Hook, president, American Rolling Mill Co., Middletown, O., was given the ASM medal for Advancement of Research; Albert Sauveur Achievement award was made to F. P. Zimmerli, chief engineer, Barnes-Gibson-Raymond Division, Associated Spring Corp., Detroit. Winner of the ASM Gold medal was Dr. C. H. Mathewson, professor of metallurgy, Yale University. W. A. Pennington, chief chemist and metallurgist, Carrier Corp., Syracuse, N. Y., was awarded the Marion Howe medal.

### WELDING SOCIETY

Seventy papers covering 16 classifications of welding applications and research were presented in 20 technical sessions during the 28th annual meeting of the American Welding Society at Hotel Sherman.

Several new developments were reported, ranging from fundamental manual techniques of joining and cutting similar and dissimilar metals, flame hardening locomotive parts to automatic methods of welding refrigerator parts and ship plates.

**German Welding Method**—A semi-automatic welding process discovered in Germany in 1945, produces a welded joint that may be termed quite satisfactory in cases where x-ray control is not paramount. Its main advantage is that it provides semi-automatic results with standard manual arc welders. Theoretically, the process increases efficiency and productivity of manual welding 25 to 30 per cent.

Another process produces homogeneous high quality butt welds in steel plates. Referred to as the Simide Process, it produces welds without filler rod by a combination of pressure and oxyacetylene fusion. Success depends greatly on accuracy of jigs used. Most of the practical applications so far were on plates of ⅛-in. thickness.

Outstanding activities of the society's 6-day meeting were the welcoming address by L. W. Delhi, vice president, Hunt, Mirk & Co., San Francisco, and 1947 president of AWS; the awarding of prizes and medals, and the Adams Lecture on "Structural Strength of the Welded Joint" by G. S. Mikhalapov, manager, apparatus research department, Air Reduction Sales, New York; and the installation of new officers for 1948.

**New AWS Officers**—H. O. Hill, assistant chief engineer, fabricated steel construction, Bethlehem Steel Co., Bethlehem, Pa., was elected president; G. N. Sieger, president and general manager, S-M-S Corp., Detroit, first vice president; O. B. J. Fraser, assistant manager, Development and Research Division, International Nickel Co., New York, second vice president; and Russell S. Donald, Thomson Electric Welder Co., Lynn, Mass., treasurer, 3-year term.

New directors for 3-year terms are: David Arnott, consultant, American Bureau of Shipping, New York; T. M. Jackson, chief electrical and welding engineer, Sun Shipbuilding & Dry Dock Co., Chester, Pa.; C. I. MacGuffie, manager of sales, Electric Welding Division, General Electric Co., Schenectady, N. Y.; and J. B. Tinnon, vice president, Metal & Thermit Corp., New York.

**Medal Winners** — Recognition in form of medals for outstanding work in welding was given the following: A. B. Kinzel, vice president, Electro-Metallurgical Co., New York, awarded the Samuel Wylie Miller Memorial medal; Perry J. Rieppel and Manley W. Mallet, Battelle Memorial Institute, Columbus, O., recipients of the Lincoln Gold medal. Twelve individuals were honored with cash awards ranging from $150 to $750 for "best paper" contests.

### RADIUM & X-RAY

The American Industrial Radium and X-Ray Society met last week at Hotel Morrison for the last time under its old name. Effective as of the annual meeting Thursday afternoon, Oct. 23, it became the Society for Non-Destructive Testing. Its publication will be called "Non-Destructive Testing."

"Profitable Mass X-Ray Inspection," "Use of Isotopes in Industrial Radiography," "Application of Radiography in Die Casting" and the "Application of the 20-Million-Volt Betatron to Industrial Radiography" were among the 16 papers presented during the sessions.

A medal was awarded to Dr. Leslie W. Ball, director of the testing section, Naval Ordnance Laboratory, White Oak, Md., as the 1947 Lester lecturer. Speaking on "Nondestructive Testing in the Design, Manufacture, and Evaluation of Naval Ordnance," Dr. Ball described the ap-

plication of nondestructive test methods developed in one of the most complete laboratories of its kind in the country.

**New Officers**—Donald M. McCutcheon, metallurgical department, Ford Motor Co., Dearborn, Mich., is the society's new president; Dr. Dana W. Smith, head, metals unit, Engineering Laboratories, Glenn L. Martin Co., Baltimore, vice president; and Dr. Leslie W. Ball, director, testing section, Naval Ordnance Laboratory, Naval Gun Factory, White Oak, Md., treasurer.

## AIME MEETINGS

The Iron and Steel and Institute of Metals Divisions of the American Institute of Mining and Metallurgical Engineers held their annual fall meetings at the Stevens Hotel last week.

Subjects discussed at the Metals Division session included recrystallization and grain growth and light metals. In view of the current interest in vacuum metallurgy, much interest was aroused by a paper, "Vacuum Process for Preparation of Lithium Metal from Sodumene."

Steel Division discussions on metallography and steelmaking occupied most of the limelight. Surface films and corrosion were discussed at joint meetings of the two divisions. Papers also were presented on plating molybdenum, tungsten and chromium by thermal decomposition, an electrolytic method for pointing tungsten wires and how magnesium reduction is used to obtain tantalum powder.

## STRUCTURAL SHAPES . . .

### STRUCTURAL STEEL PLACED

1250 tons, relocation Chicago, Burlington & Quincy Railroad, Boysen dam, spec. 1901, Bonneville, Wyo., for U. S. Bureau of Reclamation, to American Bridge Co., Pittsburgh.

765 tons, diesel shop, Chicago & North Western Railroad, Chicago, to Bethlehem Steel Co., Bethlehem, Pa.; S. N. Nielsen Co., Chicago, contractor.

715 tons, steel sheet piling, U. S. engineer, Bismarck, N. D., to Bethlehem Steel Co., Bethlehem, Pa.

660 tons, store, Bonwit-Teller, Chicago, to American Bridge Co., Pittsburgh.

400 tons, administration and engineering building, Standard Oil Co. of Indiana, Whiting, Ind., to Joseph T. Ryerson & Son Inc., Chicago.

285 tons, church, St. Rita parish, Chicago, to Mississippi Valley Structural Steel Co., Decatur, Ill.

210 tons, Vermilion river bridge, No. 100.87, Kansas, for Union Pacific Railroad, to American Bridge Co., Pittsburgh; bids Sept. 17.

165 tons, laboratory and boiler room, Cities Service Oil Co., East Chicago, Ind., to Wendnagel & Co., Chicago.

### STRUCTURAL STEEL PENDING

14,241 tons, Narrows bridge, Tacoma, Wash.; Bethlehem Pacific Coast Steel Co., San Francisco, low.

1000 tons, store building, Bond Clothes, Chicago; Friedman, Alschuler & Sincere, Chicago, architects; bids Oct. 27.

900 tons, county bridge, Allegheny, Pa.; bids Oct. 28.

625 tons, Frankel Apartment, Merion, Pa.

600 tons, dairy building, Pioneer Division, Borden Co., Paterson, N. J.

600 tons, beam bridge, Newark, N. J.; bids closed Oct. 21.

357 tons, bridge, FAS 02-3, Marquette county, Wis., for State Highway Department; bids Oct. 21.

200 tons, gymnasium, St. Mary's College, Emmitsburg, Md.

165 tons, bridge, V-030-2-19, Rock county, Wis., for State Highway Department; bids Oct. 21.

## REINFORCING BARS . . .

### REINFORCING BARS PLACED

1500 tons, medical-dental-nursing unit, University of Washington, Seattle, to Northwest Steel Rolling Mills Inc.; Seattle; general contract to J. C. Boespflug Construction Co., Seattle.

525 tons, dormitory, Massachusetts Institute of Technology, Cambridge, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Aberthaw Construction Co., Boston, general contractor.

475 tons, supermarket building, First National Stores, Portland, Me., to Bancroft & Martin Rolling Mill Co., Portland; Thomas O'Connor Co., Cambridge, Mass., general contractor.

250 tons, diesel shop, Chicago & North Western Railroad, Chicago, to Bethlehem Steel Co., Bethlehem, Pa.; S. N. Nielsen Co., Chicago, contractor.

## PIPE . . .

### CAST IRON PIPE PLACED

1500 tons, centrifugally cast water pipe, lot 2, including 16,000 feet 6-inch, 50,000 feet 8-inch and 10,000 feet 12-inch, Department of Public Works, Chicago, to U. S. Pipe & Foundry Co., Burlington, N. J.

579 tons, centrifugally cast water pipe, lot 3, group 1, 30,000 feet 8-inch, Department of Public Works, Chicago, to James B. Clow & Sons, Chicago.

410 tons, Class B water pipe, lot 1, including 15 tons 3-inch, 20 tons 4-inch and 375 tons 16-inch, Department of Public Works, Chicago, to U. S. Pipe & Foundry Co., Burlington, N. J.

### STEEL PIPE PENDING

335 tons, 36-inch water pipe, Benton Harbor, Mich.; bids taken Sept. 26 exceeded estimate and were rejected.

## RAILS, CARS . . .

### LOCOMOTIVES PLACED

Chicago & Eastern Illinois, six 1500-horsepower diesel-electric passenger engines, to the Electro Motive Division of General Motors Corp., La Grange, Ill.

Southern Pacific, three 6000-horsepower diesel-electric passenger locomotives, to American Locomotive Co., New York.

### RAILROAD CARS PLACED

Atlantic Coast Line, 3160 freight cars, to the American Car & Foundry Co., New York; award includes 1800 box cars and 1000 hopper cars of all welded construction, in accordance with the builders designs and specifications; 200 fifty-ton pulpwood cars, 100 seventy-ton phosphate cars and 60 covered hopper cars.

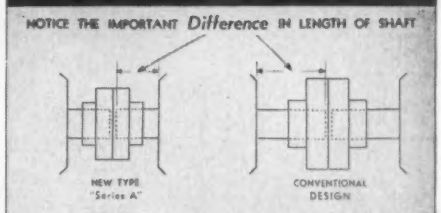
Kansas City Southern, 500 seventy-ton gondolas, to Pullman-Standard Car Mfg. Co., Chicago.

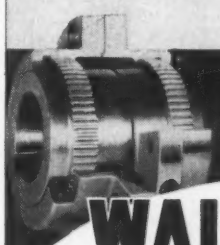
New York Central, 3000 self-clearing hoppers, 2000 of 55 tons capacity going to Despatch Shops Inc., East Rochester, N. Y., and 1000 of 70 tons capacity to Greenville Steel Car Co., Greenville, Pa., the latter for operation by the Pittsburgh and Lake Erie.

### RAILROAD CARS PENDING

Baltimore & Ohio, 2000 seventy-ton hopper cars; bids pending.


No Wonder This New Coupling Design Has Made A Hit With Coupling Buyers



THEY WANT THE ADVANTAGES OF THIS NEW

WALDRON Gear Type Series "A" COUPLING

The new "Series A" design provides a much larger maximum bore to permit use of larger shafting and equipment than heretofore could be used with a coupling of comparable size. Takes up less space, needs less shaft extension.

It embodies all Waldron construction refinements. An all steel coupling that compensates for misalignment without adding stress to shaft or bearings.

Write For This NEW Catalog

Catalog 57 contains full details and rating tables on following types: Standard, Heavy Duty, Mill Motor, Marine, Floating Shaft, Jordan, Shear Pin, Oil Collector, Cut Out. Write today.

COUPLING DIVISION

JOHN WALDRON CORPORATION
New Brunswick, N. J.

*Sales Representatives in Principal Cities*

# CONSTRUCTION AND ENTERPRISE

## ALABAMA

MOBILE, ALA.—National Gypsum Co., Baker St., has awarded a $150,000 contract to Blaw-Knox Co. for construction of a plant addition.

## ARKANSAS

FORREST CITY, ARK. — Arkansas Foundry Co., Little Rock, has purchased property here for a proposed $150,000 plant.

## CALIFORNIA

ANTIOCH, CALIF.—Fibreboard Products Co., Russ Bldg., San Francisco, has awarded a $500,000 contract to Swinerton & Walberg, 225 Bush St., San Francisco, for construction of a mill, first unit of a proposed plant.

BERKELEY, CALIF.—H. J. Heinz Co., 2900 San Pablo Ave., has awarded a $130,000 contract to Stolte Inc., 8451 San Leandro St., Oakland, for construction of a factory addition.

DIXON, CALIF.—Navy Bureau of Yards and Docks has awarded a $1 million contract to Stolte Inc., 8451 San Leandro Blvd., Oakland, for construction of radio transmitting buildings near here.

LOS ANGELES—Lloyd Corp. Ltd., 5410 Wilshire Blvd., plans to build a $140,000 warehouse.

LOS ANGELES—Maas Steel Co., 2306 E. 48th St., has been incorporated as Maas Steel Corp., with Arthur F. Maas Sr. as president. Firm plans expansion on property it recently acquired in Vernon.

LOS ANGELES—General Petroleum Corp., 108 W. Second St., has awarded a $4,900,000 contract to P. J. Walker Co., 3900 Whiteside Ave., for construction of a 13-story office building at 612 S. Flower St. Plans are by Wurdeman & Becket.

SAN FRANCISCO—G. B. Torre & Sons, 103 Bay St., plans to build a $2 million plant. Architect is J. A. Riddell, 333 Kearney St.

SAN FRANCISCO—Cresta Bros., 5098 Mission St., has awarded a $121,000 contract to Carrico & Gautier, 365 Ocean Ave., for construction of an auto parts plant.

VERNON, CALIF.—U. S. Spring & Bumper Co., 4951 Alcoa Ave., Los Angeles, plans to build a $108,000 service building on E. Washington St.

## IDAHO

BOISE, IDAHO — Syms-York Printing Co., Ninth and Bannock Sts., has awarded a $124,000 contract to J. H. Wise & Son for construction of a printing plant.

## ILLINOIS

CHICAGO—Glidden Co., 5161 W. Moffat St., plans to build a $500,000 research laboratory.

## INDIANA

TERRE HAUTE, IND. — Terre Haute Gas Corp., R. S. Brunner, president, has awarded a $200,000 contract to J. F. Pritchard & Co., 2200 Fidelity Bldg., Kansas City, Mo., for construction of a gas plant.

## IOWA

DUBUQUE, IOWA—Algonquin Chemical Co., c/o H. D. McGowan, vice president, Julian Hotel, has awarded a $1 million contract to Equipment Maintenance Co., 637 Andrus Bldg., Minneapolis, for design and construction of a sulphuric acid manufacturing plant.

MARSHALLTOWN, IOWA — Fisher Governor Co. has awarded a $500,000 contract to Arthur H. Neumann & Bros., 514 Hubbell Bldg., Des Moines, for a factory addition.

## KANSAS

CHERRYVALE, KANS.—Reliance Mfg. Co. will build a $150,000 factory.

## KENTUCKY

PRICE, KY.—Inland Steel Co. plans construction of a coal-cleaning plant with capacity of 750 tons an hour, to handle coal mined from 29,000 acres inland owns or leases in Elkhorn field.

## LOUISIANA

BATON ROUGE, LA.—Transcontinental Gas Pipe Line Co., c/o Claude Williams, president, 107 W. 14th St., Austin, Tex., will build a $400,000 pumping station 20 miles north of here.

BOGALUSA, LA.—Louisiana Tung Mill Inc. has awarded a $100,000 contract to Stocker Construction Co., 812 Olive St., St. Louis, for construction of a plant.

EUNICE, LA.—Kelly-Weber Co. Inc., W. P. Weber, president, plans construction of a $150,000 fertilizer plant here.

## MARYLAND

BALTIMORE—Locke Insulator Corp., Charles and Cromwell Sts., plans a $367,000 modernization and improvement program. Maryland Steel Products Co., 1001 N. Calvert St., will furnish structural steel.

## MICHIGAN

CHARLOTTE, MICH.—Beach Mfg. Co., Morrell at Grand Trunk Railway, has been formed by Howard Montgomery with a capital of $150,000 to manufacture and sell machinery parts.

DEARBORN, MICH. — Reliable Machine Rebuilders Inc., 8700 Brandt Ave., has been formed by Charles King with a capital of $50,000 to manufacture and rebuild tools and machinery.

DETROIT — Affiliated Industries Inc., 10212 Greensboro, has been formed by Arthur H. Kittle with a capital of $60,000 to manufacture and sell drills, reamer bushings and other products.

DETROIT—Jackson Oil Burner Mfg. Co., 9854 12th St., has been formed by Lawrence V. Rohr with a capital of $100,000 to manufacture and sell oil and gas furnaces and heaters.

DETROIT—A.C.L. Shoe Machinery Mfg. Co. Inc., 147 Joseph Campau, has been formed by Ralph Battista with a capital of $75,000 to manufacture and sell machinery and equipment.

DETROIT—General Bolt & Nut Corp., 1968 Tuxedo, has been formed by Frank J. Quinn with a capital of $50,000 to manufacture and sell miscellaneous bolts.

DETROIT—Uniflex Cable Co., 738 W. Seven-Mile Rd., has been formed by Fred S. Wreford with a capital of $50,000 to manufacture and sell electrical and mechanical devices.

LUDINGTON, MICH.—Straits Steel & Wire Corp., Cheboygan, has awarded a $100,000 contract to Strom & Strom, 1770 Sixth St., Muskegon, for construction of a 1-story factory.

SAGINAW, MICH.—Bridgeport Tool Co., 423 Gallagher St., has been formed by Russell Jameson with a capital of $75,000 to manufacture and sell tools, dies and machinery.

## MISSOURI

ST. LOUIS — Moloney Electric Co., 5390 Bircher Ave., has awarded a $200,000 contract to Widmer Engineering Co., 918 Fullerton Bldg., for construction of a plant addition.

## NEW JERSEY

PRINCETON, N. J.—Heyden Chemical Co., 393 Seventh Ave., New York, has awarded a $75,000 contract to Wortmann & Sons, 109 E. 29th St., New York, for construction of a laboratory and process building.

## NEW MEXICO

CORONA, N. M.—Central New Mexico Electric Co-operative Inc. plans power plant improvements costing $50,000.

## NEW YORK

NEW YORK—Buffalo Niagara Electric Corp., Electric Bldg., plans to build a $10 million, 80,000 kw steam generating plant in western New York on a site yet to be chosen.

## NORTH CAROLINA

EAST GASTONIA, N. C. — Gastonia Textile Machinery Co. has been incorporated by C. W. Barnes with a capital of $100,000 to manufacture and deal in machine shop equipment.

## OHIO

CLEVELAND—Jones & Laughlin Steel Corp., 3341 Jennings Rd., will soon start construction of a $220,000 foundry at 731 Clark Ave.

COLUMBUS, O.—Columbus & Southern Ohio Electric Co., 215 N. Third St., plans a $9 million substation project.

YOUNGSTOWN—Youngstown Steel Door Co. is building a $100,000 addition to its plant on N. Meridian Rd.

## PENNSYLVANIA

CLAIRTON, PA.—Carnegie-Illinois Steel Corp., Carnegie Bldg., Pittsburgh, has awarded a contract to Koppers Co. Inc., Koppers Bldg., Pittsburgh, for construction of 85 oven foundry coke ovens and rebuilding a 60-oven battery.

HAZELTON, PA.—Electric Auto Lite Co., Toledo, O., plans to build a $1 million plant here.

MORRISVILLE, PA.—Victor Chemical Works, Walter B. Brown, president, plans construction of a $1,500,000 phosphorous plant here.

NEVILLE ISLAND, PA.—Chaplin Fulton Mfg. Co., Penn Ave., Pittsburgh, will build a $100,000 plant here.

PHILADELPHIA — Philadelphia Gas Works Co., 1401 Arch St., plans gas plant improvements and additions costing $7,500,000.

PITTSTON, PA.—Greater Pittston Chamber of Commerce has awarded a $150,000 contract to Jenkins & Isaacs, 1714 Wyoming Ave., Exeter, for construction of a spring manufacturing plant.

## TEXAS

BEEVILLE, TEX. — Anderson-Pritchard Oil Co. and associated companies, Milam Bldg., San Antonio, will build a $6 million recycling plant here.

BISHOP, TEX.—Celanese Corp. has plans in progress by Nunn & McGinty, 2017 W. Gray Ave., Houston, for construction of a 10,000-sq-ft building.

EDINBURG, TEX.—Transcontinental Gas Pipe Line Co., c/o Claude William, president, 107 W. Fourth St., Austin, will build a $350,000 pumping station here.

ROSENBERG, TEX.—Houston Power & Light Co., 1016 Walker St., plans to build a $70,000 service building. Engineer is C. G. Elliot Jr., 4511 Kyle St., Houston.

SAN ANTONIO, TEX.—Swift & Co., 1901 S. San Marcos St., will spend $90,000 on plant construction and improvements.

TRINIDAD, TEX.—Texas Power & Light Co., Interurban Bldg., Dallas, will build a $3 million generating unit here.

## WEST VIRGINIA

WEIRTON, W. VA.—Weirton Steel Co. plans to build a 1-story oxygen plant to cost $4 million.

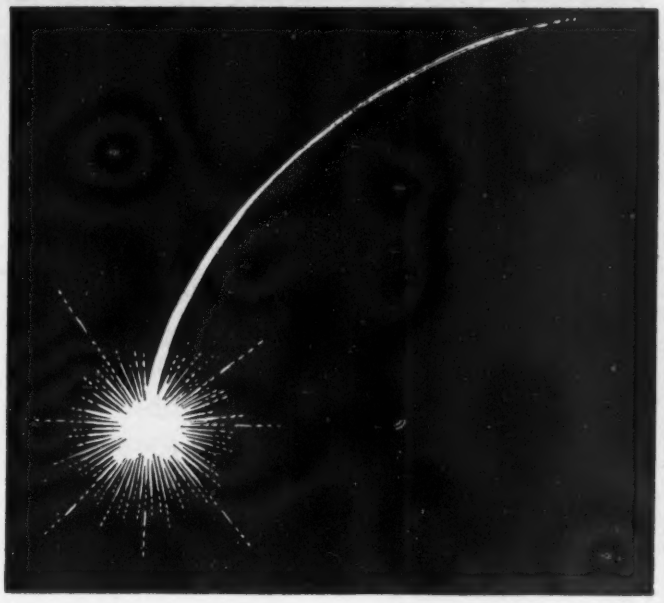
## WISCONSIN

MILWAUKEE—Briggs & Stratton Corp., 2748 N. 32nd St., has awarded a $150,000 contract to Klug & Smith Co., 111 E. Wisconsin Ave., for the design and construction of a 1-story heat treating plant.

RACINE, WIS.—S. C. Johnson & Son Inc., 1525 Howe St., has awarded a contract to Wiltscheck & Nelson Inc., 1550 Yont St., for the construction of a $750,000, 14-story research tower. Architect is Frank Lloyd Wright, Spring Green.

## MEXICO

SALAMANCA, MEX.—Petroleos Mexicanos has awarded a $12 million contract to Arthur G. McKee & Co., 2300 Chester Ave., Cleveland, for the design and construction of a petroleum refinery.



**FRICTION KILLS SHOOTING STARS. ON THE OTHER HAND, CADMAN FINE BEARING METALS KILL FRICTION.**

*The important part played by bearing metal emphasizes the great need of a more careful consideration of what is required of a babbitt in its selection. Our 87 years of experience qualifies us as bearing metal experts. We are always happy to help solve bearing problems. Ask us any time.*

## A.W. CADMAN MFG. CO.
PITTSBURGH, PA.

---

*You'll Be Back...*

EVEN if you haven't been a guest at the Drake for some time—you'll be back. Old friends always return and they're always welcome. We're proud of our reputation for comfort, service, courtesy and hospitality—they are Chicago's best. Old friend or new, once you visit the Drake you will come back. You will be welcomed.

*Edwin L. Brashears*
PRESIDENT

*The*
## DRAKE
*Chicago*

UNDER **OWNER** MANAGEMENT

---

WELCO Collector Rings are made in all sizes to carry currents of 5 to 200 amperes. Two to twelve rings can be furnished on one stub complete with brush holders, brushes, studs for supporting the brush holders and stud rings. The collector rings can be assembled as a unit on one hollow tube with threads on one end and insulation bushing on the opposite end. The brush holders carrying the current are made of brass. The collector rings are made of hard bronze material. Bakelite insulation is used.

Welco Collector Rings are custom-built to fit the special design and functional requirements of your machines or equipment. A limited number of standard types are available. Send us your blueprints and we will design for you the collector rings that are functionally correct.

## THE B. A. WESCHE ELECTRIC CO.
SS 1628-27 VINE ST. CINCINNATI, 10, OHIO

THE S F Co.

Lake Superior Iron Ores
Bessemer
Non-Bessemer
Aluminiferous

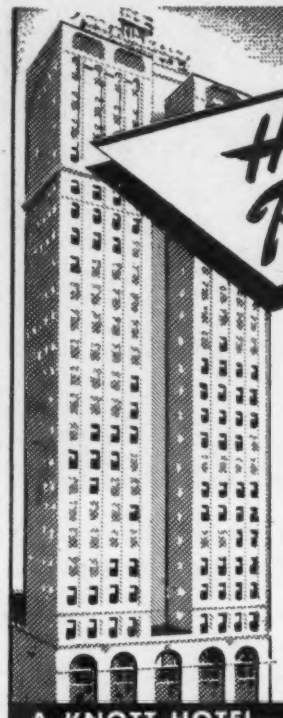
"Shenango" Pig Iron
Bessemer
Malleable
Basic—Foundry

The SHENANGO FURNACE Company

Oliver Building, Pittsburgh, Penna.

W. P. SNYDER & COMPANY

Iron Ore • Pig Iron • Coal and Coke • Oliver Bldg., Pittsburgh, Penna.



Hotel Pittsburgher

. . . the stopping place of busy people!

In the Heart of Pittsburgh's Golden Triangle . . . within easy walking distance of all important office buildings, stores and theatres . . . the Pittsburgher is the ideal spot to stay.

You'll enjoy the large comfortable rooms, every one with a private bath and radio . . . the excellent restaurants . . . and the friendly courtesy that always awaits you at the Pittsburgher

Single Rooms: $3.75 to $5.50
Double Rooms: $5.50 to $7.50

A KNOTT HOTEL—Joseph F. Duddy, Manager

GEARS SPECIAL TO ORDER

FOR OVER 50 YEARS!

Ferrous and non-ferrous gears in large diameters and heavy types made to your specifications. Choose from cast or forged steel, gray iron, bronze, silent steel, rawhide or bakelite. Also stock carrying distributors for Ramsey Silent Chain Drives and Couplings for emergency service!

THE SIMONDS GEAR & MFG. CO.

LIBERTY AT 25th • PITTSBURGH 22, PA.

**Pickling of Iron and Steel**—*By Wallace G. Imhoff*

This book covers many phases of pickling room practice and construction and maintenance of pickling equipment.

Price Postpaid $5.00

THE PENTON PUBLISHING CO.
*Book Department*
1213 W. 3rd St., Cleveland 13, Ohio

520-S

Certified Steel Abrasives

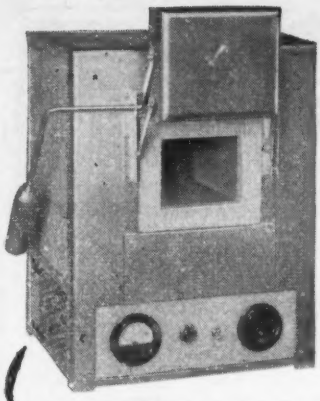
FOR USE IN BLAST CLEANING EQUIPMENT

SAMSON STEEL SHOT
ANGULAR STEEL GRIT

PITTSBURGH CRUSHED STEEL CO., PITTSBURGH, PA.
STEEL SHOT & GRIT CO., BOSTON, MASS.

TURN TO STEEL....

for help in locating scarce materials or machinery. The "Used & Rebuilt Equipment—Materials" section is the weekly meeting place for buyers and sellers of good used machinery and materials. Rates are moderate. For further information write today to STEEL, Penton Bldg., Cleveland 13, O.



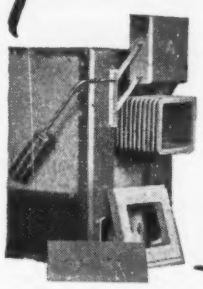
# TEMCO

## ELECTRIC FURNACE

***Fast, Uniform Heat with Improved Model OFE***

Ruggedly built to withstand hard usage and the thermal shock of fast heating, this improved TEMCO furnace features an uplifting easily operated door, the economy of thick dual insulation and easy accessibility to operating parts.

Type OFE is available in two interior sizes and two types of built-in controls. "S" models are equipped with indicating pyrometer and electrically operated input controller. By manipulation of the control knob any temperature from 350 deg. to 1900 deg. F. can be selected and held. "V" models are supplied with a fully automatic Veritron Electronic Pyrometer Controller which can be pre-set for the temperature to be maintained.



| MODEL | MUFFLE SIZE | WATTS | PRICE |
|---|---|---|---|
| OFE-S-10 | 6" x 5" x 10" | 2400 | $194.00 |
| OFE-V-10 | 6" x 5" x 10" | 2400 | 280.00 |
| OFE-S-19 | 6" x 5" x 19" | 4500 | 270.00 |
| OFE-V-19 | 6" x 5" x 19" | 4500 | 356.00 |

Operating temperatures:
1600 deg. F. — continuous
1900 deg. F. — intermittent

***Write for complete specifications and name of nearest dealer.***

**THERMO ELECTRIC MFG. CO.**
495 West Locust Street, Dubuque, Iowa

# IRWIN Hammerboards

**MORE FORGINGS per HAMMERBOARD DOLLAR!**

Grade "A" Hammerboards
"Weldrock" Hammerboards
Release Pins
Helves

**IRWIN MANUFACTURING COMPANY, INC.**
*Garland, Pa.*

IRWIN 47 YEARS of Quality

JOHN H. SIPCHEN CO. 549 Washington Blvd. Chicago, Illinois

CHARLEDGE SALES 335 Curtis Building Detroit, Michigan

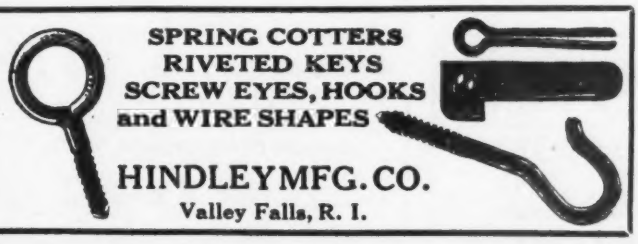
BRETT'S PATENT LIFTER CO. Ltd. Foleshill Works Coventry, England

*Have It Galvanized by—*

**Joseph P. Cattie & Bros., Inc.**
Gaul & Letterly Sts., Philadelphia, Pa.

***Philadelphia's Oldest, The Country's Largest Hot Dip Job Galvanizer***

**Galvanized Products Furnished**



**SPRING COTTERS**
**RIVETED KEYS**
**SCREW EYES, HOOKS and WIRE SHAPES**

**HINDLEY MFG. CO.**
Valley Falls, R. I.

**DIFFERENTIAL**
**STEEL CAR CO., FINDLAY, OHIO**

Air Dump Cars, Mine Cars, Locomotives, Lorries
AXLESS Trains and Complete Haulage Systems

**PERFORMATED METALS**
TO YOUR REQUIREMENTS
FOR
**ALL INDUSTRIAL USES**
**ARCHITECTURAL GRILLES**

SEND FOR CATALOG NO. 34
**DIAMOND MFG. CO.**
BOX 32 WYOMING, PA.

*Write with Paint*

***on any surface***
**HOT, OILY, COLD WET OR DRY**
MARKINGS ARE WEATHER-PROOF FADE-PROOF PERMANENT

A Type for Every Purpose. Choice of Colors. Write for Samples. Tell us Your Marking Problems.

**MARKAL CO.** 631 N. WESTERN AVE. CHICAGO 12, ILLINOIS

**RYERSON STEELS in Stock**

Thousands of kinds, shapes and sizes of steel in stock at twelve plants. Call Ryerson first for prompt action on steel.

**Joseph T. Ryerson & Son, Inc.**
*New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles.*

MECHANICAL TUBING
PRESSURE TUBING
STAINLESS TUBING
TUBULAR SERVICE
AIRCRAFT TUBING
SEAMLESS STEEL PIPE
STAINLESS STEEL PIPE
**TUBULAR SERVICE CORPORATION**

**WIRE**
ALUMINUM and Bronze Sizes: .007 and Larger
STEEL All Finishes
THE SENECA WIRE & MFG. CO., FOSTORIA, OHIO.

**THE BELMONT IRON WORKS**
*STRUCTURAL STEEL—BUILDINGS & BRIDGES*
*RIVETED—ARC WELDED* *Cable Address—Beliron*
Engineers—Fabricators—Erectors—Contractors—Exporters
*Shops—Philadelphia—Eddystone—Royersford*
Main Office: Phila. 46, Pa.
New York Office—44 Whitehall St., N. Y. 4, N. Y.

**SAVE MONEY**
***ON PRESSED STEEL PARTS!***

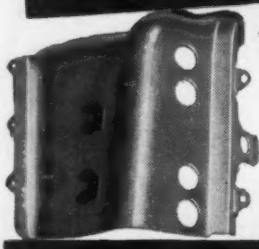
If you want to save money on pressed steel parts, call on Budd's wide experience in steel stampings of all kinds.

Like hundreds of manufacturers, you can take advantage of Budd "know-how" to lower production costs on blanks and stampings, in both regular grade and stainless steel. At your service Budd places the best-equipped machine shop—for both large and small dies—on the Atlantic seaboard.

Write today, sending a sample, blueprint or pencil sketch of your product, and let us quote you a price.

**BUDD** THE BUDD COMPANY
Dept. 16 Philadelphia 32, Pa.

**WHITEHEAD**
*The Stamp of Quality*



Since 1903, Whitehead has been recognized as a source of economical, accurate, and dependable stampings. Send your blueprints for an estimate.

**WHITEHEAD STAMPING CO.** WHITEHEAD EST. 1903
1667 W. LAFAYETTE BLVD., DETROIT 16, MICH.

**USED and REBUILT EQUIPMENT**
**MATERIALS**

**FOR SALE**
**FLOOR PLATES**
600 pcs. 1/8 x 48 x 96"
35 pcs. 14 gauge 48 x 96"
90 pcs. 14 gauge 36 x 96"
143 pcs. 16 gauge 36 x 96"
135 pcs. 16 gauge 30 x 96"
**KLINE IRON & METAL COMPANY**
P. O. Box 1013 Columbia, S. C.
Telephones: 3670 and 4-1464

**RAILS** NEW AND RELAYING
TRACK ACCESSORIES
*from* **5** *Warehouses*
• PROMPT SHIPMENTS
• FABRICATING FACILITIES
• TRACKAGE SPECIALISTS
*EVERYTHING FROM ONE SOURCE*
**L. B. FOSTER COMPANY**
PITTSBURGH CHICAGO
NEW YORK SAN FRANCISCO

**RELAYING RAIL**
TRACK ACCESSORIES
**MIDWEST STEEL CORP.**
Gen'l Off. CHARLESTON 21, W. VA.
Warehouses
CHARLESTON, W. VA.
KNOXVILLE, TENN. • PORTSMOUTH, VA.

**New RAILS Relayers**
All sizes and weights. Also frogs, switches, spikes, bolts, tie plates, contractors' and mill equipment carried in stock.
480 Lexington Ave., New York, N. Y. M. K. FRANK Stack Bldg. Reno, Nev. Park Bldg. Pittsburgh, Pa. Carnegie, Pa.

**Wanted—SHEARINGS**
Any Amount—All Sizes, Galvanized, Cold and Hot Rolled Aluminum—Stainless and Copper. 6" Minimum Width to 36" Minimum Length. Uniform Quantities. Gauges from 16 to 30 inclusive.
Write or Wire
**Los Angeles Sheet Metal Mfg. Co.**
901-903 E. 9th St. Los Angeles 21, Calif.
TRinity 4713

BORING MILLS, 24"-42"-52"-66"-72"-96"
FLANGER, ¾" McCabe.
GRINDER, Knife 10' Bridgeport, M.D.
GRINDER, Surface #16 Blanchard.
HAMMER, 4-B Nazel 5" x 5" M.D.
LATHE, Turret 24" Gisholt, 6¼" hole.
MILLERS, Plain Nos. 3 K&T and No. 4 Cin.
MILLERS, Vertical Nos. 3 & 4 Cin.
SHAPER, 36" Morton Draw Cut.
SLOTTER, 12" Putnam, 33" table, B.D.
STRAIGHTENER, Plate 110" x 1¼", H&J.
**WEST PENN MACHINERY COMPANY**
1208 House Bldg. Pittsburgh 22, Pa.

**FOR SALE**
**ONE USED 132" MORGAN SHEAR**
With electrical equipment and caster bed, capable of shearing mild carbon steel plates up to 1-1/2" thick by approximately 120" long. For further information and inspection, write
P. O. BOX 1076
PITTSBURGH 30, PA.

# EQUIPMENT...MATERIALS

## 8 EXHAUST FANS

**New — Unused**

120,000 CFM, Type "K" Buffalo Forge Mfgr. Capacity 120,000 CFM @ ½" S.P., 314 RPM at 110° F.

**IRON & STEEL PRODUCTS, INC.**
13462 S. Brainard Ave., Chicago 33, Ill.

*"ANYTHING containing IRON or STEEL"*

---

FOR SALE

## ALLOY STEEL

**ROUND, HEX, SQUARE BARS**

**New York and Pittsburgh Warehouse Stocks**

**L. B. FOSTER CO.**

9 Park Place, New York 7
Phone—Barclay 7-2111
P. O. Box 1647, Pittsburgh 30
Phone—Walnut 3300

**Michigan Distributor**
C. J. GLASGOW COMPANY
2009 Fenkell Ave., Detroit 3
Phone—Townsend 8-1172

---

## FOR SALE

5—27" WF Beams 145# 80'
4—30" WF Beams 172# 80'

**KLINE IRON & METAL COMPANY**
P. O. Box 1013, Columbia, S. C.
Telephones 4-1464 and 3670

---

## ROLLING MILLS *and* EQUIPMENT

**FRANK B. FOSTER, INC.**
2217 OLIVER BLDG. PITTSBURGH 22, PA.
Cable Address FOSTER Pittsburgh

---

**SEND FOR OUR NEW STOCK LIST**
Hot & Cold Rolled Steel, Stainless, Aluminum Sheets, Strip, Coils, Rods, Tubing, Wire, etc.

**SEABOARD STEEL COMPANY, INC.**
New Haven, Conn.

---

## FOR SALE

| Quantity | Description | Size | Unit Price |
|---|---|---|---|
| 35 tons | Stainless Sheet Steel | (11 Ga) 23½x105½ | open |
| 10,000 lb. | Brass Flat | .060" x 1⅛ | .2403 per lb. |
| 20,000 lb. | Brass Flat | .060" x 2¼ | .2925 per lb. |
| 10,000 lb. | Brass Flat | .093" x 2 15/16 | .2925 per lb. |
| 79,985 lb. | Brass Bars | ¾" Dia. | .2289 per lb. |
| 6,506 lb. | Brass Bars | 1⅛" Dia. | .2203 per lb. |
| 11,890 lb. | Brass Bars | 9/16" Dia. | .2296 per lb. |
| 22,877 lb. | Brass Bars | 11/16" Dia. | .2289 per lb. |
| 107,844 lb. | Brass Bars | 27/32" Dia. | .2284 per lb. |
| 20,079 lb. | Brass Bars | 1 1/16" Dia. | .1778 per lb. |
| 13,923 lb. | Brass Hinge Stock | No. 1 | .284 per lb. |
| 9,851 lb. | Brass Hinge Stock | No. 2 | .3401 per lb. |
| 4,298 lb. | Brass Hinge Stock | No. 2R | .34 per lb. |
| 4,022 lb. | Brass Hinge Stock | No. 3 | .337 per lb. |
| 5,314 lb. | Brass Hinge Stock | No. 4 | .3426 per lb. |
| 337 | Std. Circulating Pumps (Ruthman) | | 32.06 ea. |
| 8,442 | Emery-Disc | No. 24 grit-unslotted | .318 ea. |
| 5,250 | Welding Rod | 3/16 F.W. 35 | .53 per lb. |
| 20,464 | Flat Head CTSK Socket | ¾ x 11/16 | .075 ea. |
| 111,795 | Flat Head CTSK Socket | No. 36 | .075 ea. |

SEND FOR COMPLETE LIST
Over 200 Items
Write — Wire — Phone
W. E. Staff, Jr.

**DIEBOLD, INC.**
818 Mulberry Rd. Phone: Canton 4-5151 Canton, Ohio

---

RAIL
STEEL PLATE
STRUCTURALS, PIPE,
TUBING, WIRE ROPE,
FERROUS AND NON-FERROUS SCRAP

***BOUGHT-SOLD***
***LIQUIDATED***

**DULIEN STEEL PRODUCTS, Inc.**
of Washington
9265 E. Marginal Way • Seattle 8, Wash. • LAnder 6000

---

TWO ROTARY CONVERTERS, excellent condition, Allis-Chalmers make, Bullock type, Volts full load 600/DC, 25 cycle, 1667 amps, 300 R.P.M.

TWO TRANSFORMERS, excellent condition, Westinghouse make, 900 KVA.

TWO MOTORS, on Rotary Converters, excellent condition, 200 H.P., 370 Volts, 25 cycle, 375 R.P.M., Allis-Chalmers make.

SWITCHBOARD, PANELS, ETC. from Discontinued Power House.

**MILLER JUNK & WASTE CO.**
So. Prince & Hazel Sts. Lancaster, Pa.

---

**Stainless Steel & Alloy**

## WELD ROD

Gov't surplus—new and in perfect condition

| | | |
|---|---|---|
| TYPE 310 | | |
| P & H size ⅛" | 8,250# | 20 cents/# |
| TYPE 307 MN | | |
| P & H AW3C size ¼" | 14,800# | 15 cents/# |
| Arcos Chromang size 5/32" | 75,000# | 15 cents/# |
| SW 164 size 3/16" | 4,600# | 15 cents/# |
| SW 164 size ¼" | 2,700# | 15 cents/# |
| AWS CLASS E10020 | | |
| SW 101 size ¼" | 5,700# | .05 cents/# |
| SW 101 size 3/16" | 5,250# | .05 cents/# |

F.O.B. our plant Terms: Cash with Order

**STAINLESS FOUNDRY & ENGINEERING CO.**
5132 N. 35th St. Milwaukee 9, Wis.

---

**FOR SALE**

15 tons 12 gauge, and 20 tons 14 gauge, HR, P & O, 24" and wider x 72" and longer.

**Henry Stewart Steel Supply Co.**
424 Book Bldg. Detroit, Mich.
CAdillac 9404

---

## CARGO CRANE

Link-Belt, 10 ton capacity, one man controlled, compact yard crane. Carries as well as picks up. Telescoping boom. Fast operation. Widely used in steel stock yards, railroad shops, steel fabricators, concrete pipe yards. Send for literature. Bargain price on new unit $7700.

RALPH BAGGALEY
SChenley 7000
515 So. Aiken Ave. Pittsburgh 6, Pa.

---

## 45-TON GUY DERRICK

Completely equipped except for cable, with or without bullwheel, boom 95 ft.—mast 110 ft. or boom 100 ft.—mast 120 ft.

Write Box 237
STEEL, Penton Bldg., Cleveland 13, O.

# EQUIPMENT ... MATERIALS

## PUBLIC AUCTION

### PRECISION TOOLS — STREAMLINED FACTORY

On Thursday, November 6th, at 10:00 A.M., we will sell at absolute piecemeal auction the equipment of the Cleveland plant of Sommer and Adams Co., machine tool builders located at 18511 Euclid Ave. Items consist of Drills, Millers, Shapers, Jig Mills, Jig Borers, Horizontal Boring Mills, Grinders, Lathes, Planers, Office & Drg. Rm. Equipment, etc. There is a $100,000 tool crib and $50,000 inspection department. Send for catalogue. Make personal inspection, or phone representative on premises.

**WHERE—18511 Euclid Ave., Cleveland, Ohio.**
**WHEN—10 A.M. Thursday, Nov. 6th.**
**Sale Conducted In Heated Building.**

The approximate 24,000 sq. ft. modern factory with 4 overhead cranes will be sold subject to owner's acceptance or rejection within 24 hrs. The excellent natural as well as fluorescent lighting is unusual. Ultra modern offices and drawing room are an inspiration. Who can afford to operate in a less efficient building?

***Inspection Daily, to Date of Sale***

**HETZ CONSTRUCTION CO.**
**18511 EUCLID AVE., CLEVELAND, O. PH. KENMORE 0810**
**AUCTIONEERS APPRAISERS LIQUIDATORS**

## OVERHEAD CRANES

3—10 ton MODERN 2 Trolleys, 5 Motors on each crane, 230 V. DC, 30 ft. lift, spans are 81', 40' and 39', still on runways, located in St. Louis. Full specs on request, inspection by appointment.

**Samuel M. Davis**
**510 LaSalle St. St. Louis 4, Mo.**

## FOR SALE

**2—Hydraulic Riveting Machines**
Watson-Stillman 48" Throat,
1½" Daylight
**Address Box 733,**
**STEEL, Penton Bldg., Cleveland 13, O.**

## MACHINERY FOR SALE

24", 36" and 48" Rebuilt Liberty Planers
#4 Cincinnati Vertical Mill
6 x 24 LaSalle Surface Grinders
30" Lathe
LIBERTY PLANERS, INC.
Hamilton, Ohio

# CLASSIFIED

## Opportunities

### SHINING OPPORTUNITY

—to establish a main plant or branch, to make furniture hardware, metal trim, screws, etc. in heart of nation's biggest wood furniture mfg. area. Convincing details and full information, from

**CHAMBER OF COMMERCE**
445 N. Main High Point, N. C.

**LIGHT METAL FOUNDRY—PART OR ENTIRE**
San Francisco peninsula. 21,000 sq. ft., all modern facilities for sand and permanent mold magnesium and aluminum castings. Monthly capacity, 1,000,000 lbs. permanent mold, 300,000 lbs. sand casting. Well equipped Pattern Shop; 4 Lindberg Heat Treating Furnaces, Sand Mullers & Hoppers, Roll-over Machines, Hellare Welding, Trimming Booths, Electric Conveyor systems, and special fire protection devices. Further details to principals only. Write Box 233, STEEL, Penton Bldg., Cleveland 13, O.

## Opportunities

### FOR SALE A FOUNDRY

land, buildings, machinery, stock and equipment. Located in Providence • Established 50 Years
**RICHARD F. RICHARDSON**
804 Turks Head Building
Providence 3, Rhode Island

### TOOL STEEL WAREHOUSE

**For Sale**
Including stock of steel and equipment.
**$3,500.00**
**HERCULES STEEL CO.**
246 Hanna Bldg. Cleveland 15, O.

**FOR SALE OR LEASE**
5,000 Sq. Ft., Oilfired Steam Heat, Present equipment, 6 turret lathes, 1, 2⅝, 5 & 6" hole. Max. swing 36"; No. 2 Cincinnati Centerless; No. 1 to No. 6 taper drill presses; 20 other machine tools individually motorized. Excellent skilled and unskilled labor market. Location central for auto parts production or your own product. Contact Grain Processors Corporation, Linden, Michigan, Phone 10.

## Professional Services

### THE F. A. SCHNEIDER CO.

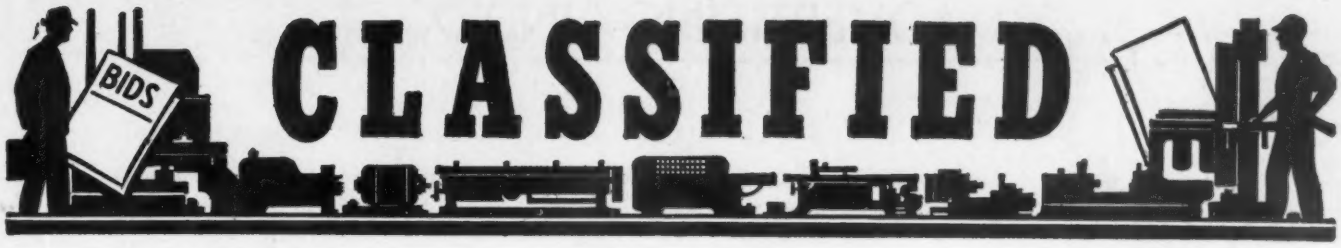
*Consulting Engineers*
Manufacturing Buildings, Process Plants and Related Building Structures, Designs, Layouts and Details.
118 E. Southern Ave. Bucyrus, Ohio

## Employment Service

**SALARIED POSITIONS $2,500-$25,000. THIS** thoroughly organized confidential service of 37 years' recognized standing and reputation carries on preliminary negotiations for supervisory, technical and executive positions of the calibre indicated through a procedure individualized to each client's requirements. Retaining fee protected by refund provision. Identity covered and present position protected. Send only name and address for details. R. W. BIXBY, Inc., 110 Dun Bldg., Buffalo 2, N. Y.

## Representatives Wanted

**REPRESENTATIVES WANTED FOR ONE OF Detroit's oldest and leading tool and die jobbing shops, equipped to handle large volume of jigs and fixtures, special machinery, and medium and small dies. Have sales representative openings in many metropolitan areas on commission basis. Address Box 219, STEEL, Penton Bldg., Cleveland 13, O.**




## Help Wanted

### SALES MANAGER

Established steel mill needs an executive with proven ability and background in sales management. Prior experience with hot rolled mill products essential. Salary will be commensurate with ability. Write full particulars to Box 213, STEEL, Penton Bldg., Cleveland 13, O. Confidential.

**ROLLING MILL SUPERINTENDENT.** AN UNusual opportunity is available for an able, experienced engineering executive for a mill rolling special alloys such as stainless steel. Thorough understanding of, and experience in the operation and maintenance of electrical and mechanical equipment is, of course, essential. Additionally, the man selected will be one who has a real record of successful personnel administration, including the selection and training of mill crews. Your reply will be held in the strictest confidence. It should cover fully, education, background and experience, and all other details that will make it possible to consider the initial application thoroughly. Address Box 225, STEEL, Penton Bldg., Cleveland 13, O.

## Positions Wanted

### WORKS MANAGER—EXECUTIVE ENGINEER

Broad successful industrial experiences in all phases of modern plant management in U.S.A. and Europe, seeks permanent connection with a live wire organization. Salary $15,000.00 — Please state your requirements. Excellent references.

Write Box 188,
STEEL, Penton Bldg., Cleveland 13, O.

**SALES ENGINEERING, YOUNG MAN WITH** industrial sales experience, engineering and manufacturing background, desires a position that affords an opportunity to incorporate this experience with sales. Available immediately. Located in Cleveland, willing to travel. Write Box 238, STEEL, Penton Bldg., Cleveland 13, O.

**POSITION WANTED AS OPEN HEARTH SU**perintendent, Basic or Acid Practice. Write Box 241, STEEL, Penton Bldg., Cleveland 13, O.

## Accounts Wanted

A reliable Chicago area Engineering, Designing, and Sales Organization wants to represent high quality manufacturers in

**Sheet and Plate Fabrication**
**Structural Fabrication**
**Machine Shop**
**Stamping Shop**

We have a competent staff of Engineers to service all of the above categories, and in addition, we have many fine contacts in the above manufacturing businesses.

Address Box 224,
STEEL, 520 N. Michigan Ave., Chicago 11, Ill.

## Help Wanted

**WANTED: GENERAL SUPERINTENDENT** not over 38 years old. Must be a willing hard worker, capable and experienced in the construction of all types of API-ASME Code pressure vessels. Must be able to assume complete responsibility of operating a plant of 200 or more employes, including night shift, have thorough knowledge of all manufacturing procedures, modern production methods, plant layout, planning and meeting production schedules, labor estimating, maintenance and capable of maintaining budget and burden figuring in relation to plant operations to achieve the lowest operating costs possible and be a leader of other men. Write Box 211, STEEL, Penton Bldg., Cleveland 13, O.

### STRUCTURAL STEEL DETAILERS & CHECKERS

Must be thoroughly experienced
49 Hrs Weekly

**CARNEY & ASSOCIATES, LTD.**
824 Hamilton St. Allentown, Pa.

Wanted

### PLATE AND TANK SALES ENGINEER

Must be experienced designer and estimator, familiar with pressure and code work. Excellent opportunity for aggressive, ingenious young engineer. Give full information and references first letter. Write Box 232, STEEL, Penton Bldg., Cleveland 13, O.

## Help Wanted

### Wanted at Once

### TWO STEEL MILL SUPERINTENDENTS

For west coast steel mill. Must have thorough production experience. Permanent position—good salary. Excellent opportunity for qualified men. Write full details and past work history to Box 212, STEEL, Penton Bldg., Cleveland 13, O. Confidential.

**WANTED: EXPERIENCED FOREMAN FOR** National and Ajax Upsetter crews, sizes 2" to 7⅛". Capable of supervising setups. Excellent working conditions and future. Write stating references and experience to Box 239, STEEL, Penton Bldg., Cleveland 13, O.

**WANTED: MACHINE DESIGNERS AND** Checkers for steel mill machinery. Only experienced responsible men need apply. Salary open. Write The Aetna-Standard Engineering Co., Home Savings & Loan Bldg., Youngstown, Ohio.

**CIVIL ENGINEER FOR STEEL FABRICAT**ing shop, permanent position with unusual opportunity for advancement in small organization. Apply Tippett & Wood, Phillipsburg, N. J.

### SPECIAL MANUFACTURERS TO INDUSTRY . . . *Since 1905*

**Metal Specialties comprised of STAMPINGS, FORMING, WELDING, SPINNING, MACHINING. All Metal or Combined with Non-Metal Materials**

WRITE FOR FOLDER
LARGE SCALE PRODUCTION
OR PARTS AND DEVELOPMENT ONLY

**GERDING BROS.**
SE THIRD VINE ST. ● CINCINNATI 2, OHIO

### NO TUBING PROBLEM TOO TOUGH!

*Send Us Your Inquiry*

We fabricate tubing up to ¾" OD in any metal. Tough jobs and short runs that the other fellow doesn't want are solicited. Tubes can be bent, flared, beaded, soldered by modern induction heat, or have other operations performed to your print. Write, wire or call FRANKLIN PRODUCTS COMPANY, 6750 Orchard Lake Road, Franklin, Mich. Phone, Pontiac 8090.

### ALMA PAYS THE FREIGHT

- Job Machining
- Production Machining
- Automatic Screw Machining
- Heat Treating—Welding
- Tools—Jigs—Fixtures—Gages
- Special Machinery
- Designing—Engineering
- Complete Assemblies
- Modern Factory

*Send In Your Blue Prints For Quotation.*

**ALMA MOTOR COMPANY**
Office—1434 National Bank Bldg.
Telephone, Clifford 2716
Detroit 26, Michigan

# ADVERTISING INDEX


A

Acme Machine Tool Co., The ... 30
Ajax Flexible Coupling Co., Inc. ... 142
Allis-Chalmers Mfg. Co. ... 8, 9
Alma Motor Co. ... 155
Aluminum Company of America, Chemicals Division ... 6
American Brass Co., The ... 17, 18
American Cable Division, American Chain & Cable ... 137
American Chain & Cable, American Cable Division ... 137
American Rolling Mill Co., The ... 69
Atlas Drop Forge Co. ... 119

B

Babcock & Wilcox Tube Co., The ... Inside Front Cover
Baker, J. E., Co., The ... 29
Belmont Iron Works, The ... 152
Bethlehem Steel Co. ... 1
Birdsboro Steel Foundry & Machine Co. ... 135
Bixby, R. W., Inc. ... 154
Bliss, E. W., Co. ... 71
Brosius, Edgar E., Co., Inc. ... 144
Brown-Brockmeyer Co., The ... 11
Bryant Chucking Grinder Co. ... 55
Budd Co., The ... 152
Buffalo Bolt Co. ... 12
Bundy Tubing Co. ... 91
By-Products Steel, Division of Lukens Steel Co. ... 20

C

Cadman, A. W., Mfg. Co. ... 149
Canedy-Otto Mfg. Co. ... 21
Carborundum Co., The, Refractories Division ... 14, 15
Cattie, Joseph P., & Bros., Inc. ... 151
Central Steel & Wire Co. ... 85
Cincinnati Shaper Co., The ... 2
Cold Metal Products Co., The ... 89
Colonial Broach Co. ... 87
Cooper-Bessemer Corporation, The ... 22

D

Dempster Brothers, Inc. ... 3
Detroit Steel Corporation, Reliance Steel Division ... 40
Diamond Mfg. Co. ... 151
Differential Steel Car Co. ... 151
Doehler-Jarvis Corporation ... 115
Dore Manufacturing Co., Inc. ... 136
Drake Hotel, The ... 149
Dulien Steel Products, Inc. ... 153

E

Eaton Manufacturing Co., Foundry Division ... 24
Electric Controller & Mfg. Co., The ... 111

F

Farval Corporation, The ... Inside Back Cover
Foster, Frank B., Inc. ... 153
Foster, L. B., Co. ... 152, 153
Frank, M. K. ... 152

G

General Electric Co. ... 36, 37
General Steel Warehouse Co., Inc. ... 94
Gerding Bros. ... 155
Gisholt Machine Co. ... 7
Great Lakes Steel Corporation ... 60

H

Hallden Machine Co., The ... 140
Hanlon-Gregory Galvanizing Co. ... 116
Hindley Mfg. Co. ... 151
Horsburgh & Scott Co., The ... 141

I

Inland Steel Co. ... 43
International Nickel Co., Inc., The ... 44
Irwin Manufacturing Co., Inc. ... 151

K

Kline Iron & Metal Co. ... 152, 153

L

Lake City Malleable Co., The ... Back Cover
Lincoln Electric Co., The ... 93
Lodge & Shipley Co., The ... 30
Logemann Brothers Co. ... 133
Los Angeles Sheet Metal Mfg. Co. ... 152
Lukens Steel Co., By-Products Steel Division ... 20

M

Markal Co. ... 151
Martin Electric Co. ... 16
Medart Co., The ... 114
Midwest Steel Corp. ... 152

N

National Lead Co. ... 13
National Steel Corporation ... 60
Niagara Machine & Tool Works ... 26, 27

O

Ohio Locomotive Crane Co., The ... 151
Ozalid Division of General Aniline & Film Corporation ... 101

P

Pittsburgh Crushed Steel Co. ... 150
Pittsburgher Hotel ... 150
Pittsburgh Lectromelt Furnace Corporation ... 99
Preformed Wire Rope Information Bureau ... 137
Potter & Johnston Machine Co. ... 97

R

Reliance Steel Division, Detroit Steel Corporation ... 40
Republic Steel Corporation ... 10
Riverside Metal Co., The ... 23
Rodgers Hydraulic, Inc. ... 138
Ryerson, Joseph T., & Son, Inc. ... 152

S

Schneider, F. A., Co. ... 154
Seaver, Jay J., Engineers ... 145
Seneca Wire & Mfg. Co., The ... 152
Sheffield Corporation, The ... 38
Shenango Furnace Co., The ... 150
Simonds Abrasive Co. ... 35
Simonds Gear & Mfg. Co., The ... 150
Snyder, W. P., & Co. ... 150
Square D Co. ... 19
Sterling Bolt Co. ... 31

T

Thermo Electric Mfg. Co. ... 151
Thomas Steel Co., The ... 107
Timken Roller Bearing Co., The, Steel & Tube Division ... 112, 113
Tinnerman Products, Inc. ... Front Cover
Tubular Service Corporation ... 152

U

Union Chain & Manufacturing Co., The ... 63

V

Veeder-Root, Inc. ... 28
Victor Equipment Co. ... 25

W

Waldron, John, Corporation ... 147
War Assets Administration ... 34
Wellman Engineering Co., The ... 5
Wesche, B. A., Electric Co., The ... 149
Westinghouse Electric Corporation ... 103, 104, 105, 106
West Penn Machinery Co. ... 152
Whitehead Stamping Co. ... 152
Wickwire Spencer Steel Division, The Colorado Fuel & Iron Corporation ... 33
Williams-White & Co. ... 143
Wolff, Benjamin, & Co. ... 110

Y

Young Brothers Co. ... 32
Youngstown Sheet & Tube Co., The ... 109


~ ~ ~


Table of Contents, Page 39
Classified Advertising Pages 152, 153, 154, 155

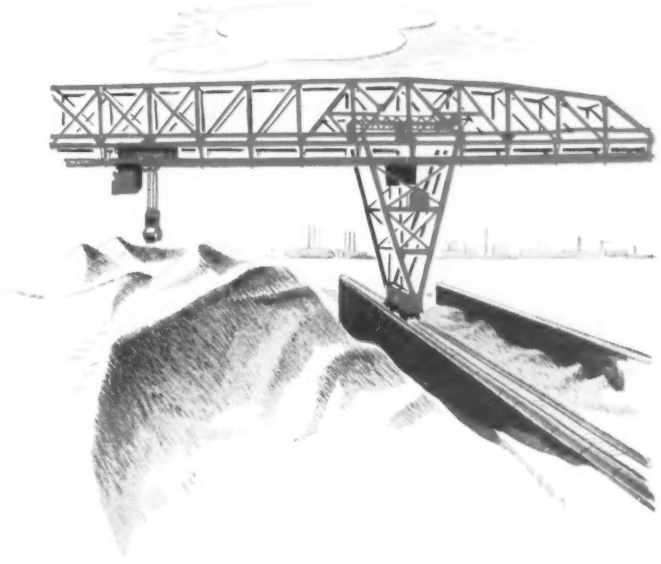
# $6090 loss charges for broken yokes cut to $435

IN a single season at a steel company's unloading dock, the ore bridges broke 14 yokes on the bucket controls. New parts for each replacement cost $50. But far more serious was the 3½ hours' time lost in replacing each yoke — time charged for at the rate of $10 an hour, plus $100 an hour more for the boat delay. Investigation showed that improper lubrication was causing the trouble—a recurring expense of $435 per break, or a total of $6090 loss for one season.

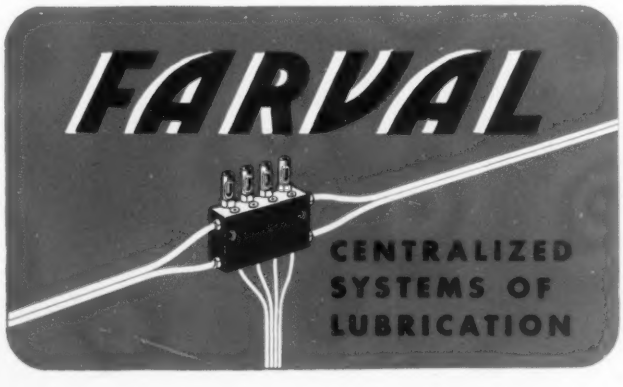
Farval Centralized Lubricating Systems, installed on the six ore bridges, solved the lubrication problem. Since then only one yoke has been broken. Thus an annual loss from broken yokes has been reduced from $6090 to only $435. The first season's saving more than paid for Farval.

Farval delivers oil or grease under pressure to a group of bearings from one central station, in exact quantities, as often as desired. Farval is the Dualine System with the Positive Piston Displacement Valve. This valve has but two moving parts and is fully adjustable, with a Tell-tale indicator at each bearing to show the job is done. For a full description of Farval, write for Bulletin 25, The Farval Corporation, 3270 East 80th Street, Cleveland 4, Ohio.

*Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing.*
*In Canada: Peacock Brothers Limited.*



FARVAL—*Studies in Centralized Lubrication No. 87*

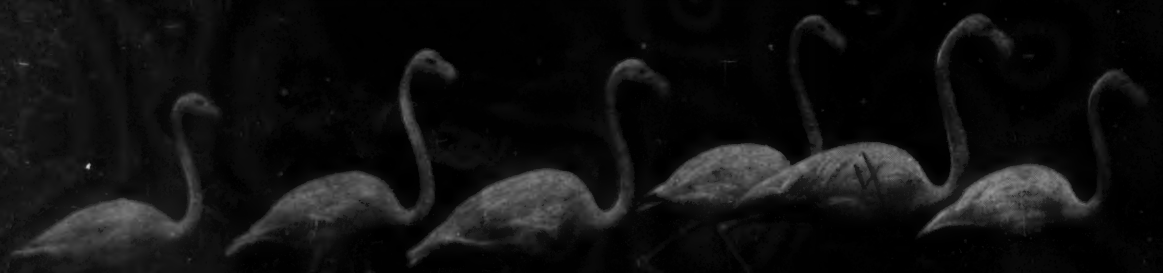


# March on!

every year under this trademark

"SHOCK PROOF"
Malleable Castings

**March on!**



The Lake City Malleable Co.
Cleveland, Ohio